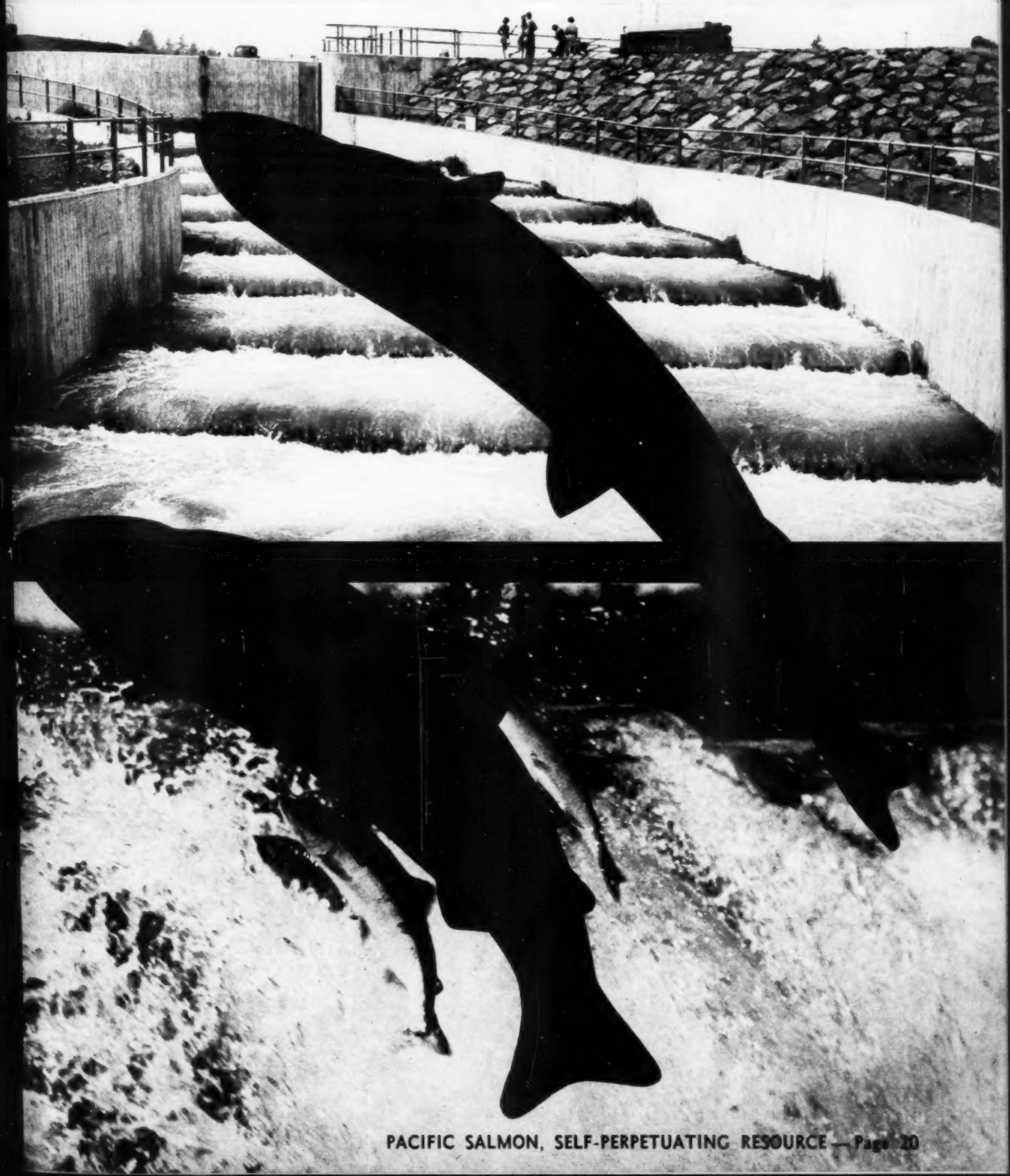
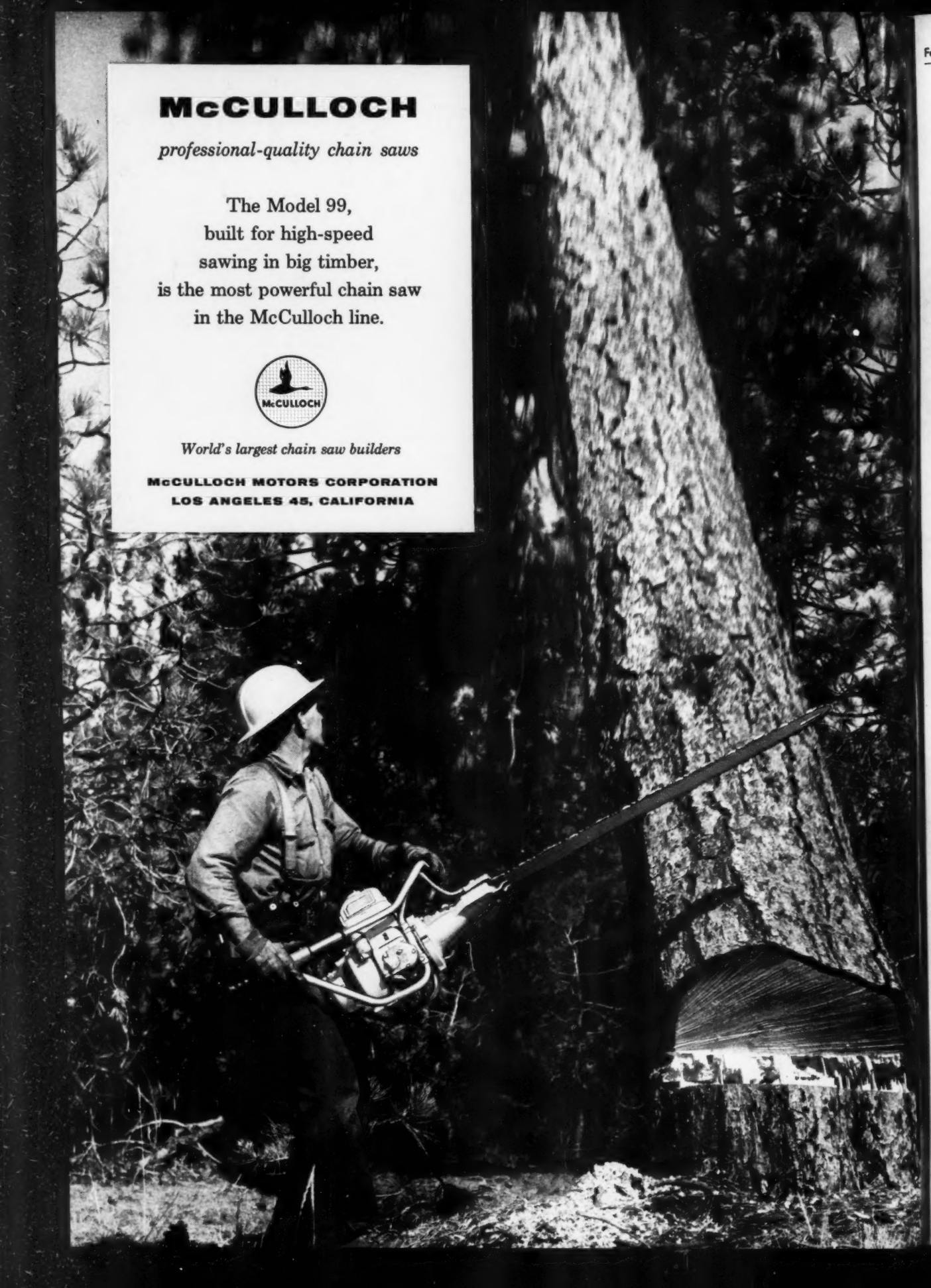
American

FORESTS

FEBRUARY 1955 50 CENTS



PACIFIC SALMON, SELF-PERPETUATING RESOURCE — Page 20


McCULLOCH
professional-quality chain saws
The Model 99,
built for high-speed
sawing in big timber,
is the most powerful chain saw
in the McCulloch line.
McCULLOCH
World's largest chain saw builders
McCULLOCH MOTORS CORPORATION
LOS ANGELES 45, CALIFORNIA

THE STORY OF TREE FARMING | One of a series of advertisements appearing in several national magazines in the interest of better public understanding of tree farming and the forest products industry.

ELK HERD moving to lower altitude after first snow on a Pacific Northwest tree farm. Clear-cut areas at lower elevation provide winter forage, while stands of seed trees afford shelter.

tree farms provide benefits for man and wildlife...

Architects are using more and more wood to bring comfort and individuality into modern homes. The warmth of natural wood is ideal for this pleasant, informal den.

A perpetual supply of wood for lumber, pulp, paper and countless other products is the main objective of America's 5,400 tree farmers. However, scientific management of timber as a crop on privately owned tree farms produces other benefits of great importance to both man and wildlife.

Good forest management plans consider the relationship between the business of providing a permanent supply of wood for the nation and such other factors as watersheds, food and shelter for wildlife, and recreation areas. Timberlands which are properly managed help retain moisture and rainfall in the forest soil to supply streams, lakes and water tables. Wildlife thrives on tree farms, finding abundant forage in the harvested areas and shelter in the larger timber stands. On tree farms, constant protection from fire, insects and disease helps preserve these many benefits for America.

Today, about 32 million acres of tax-paying timberland all across the nation are operated as tree farms. All Weyerhaeuser Timber Company forestlands are certified tree farms. *Write us at Box A, Tacoma, Washington for a free booklet,* ***Tree Farming in the Pacific Northwest.***

Weyerhaeuser Timber Company

WEYERHAEUSER
TIMBER

Volume 61
No. 2
February, 1955

American FORESTS

James B. Craig, Editor
Marian E. Fadeley, Editorial Assistant
Keith R. McCarthy, Assistant Editor
James J. Fisher, Art Director

Published by The American Forestry Association, 919 17th Street, N.W., Washington, D. C.

Contents

WASHINGTON LOOKOUT — *Albert G. Hall* 5
EDITORIAL — The Potomac River, a National Disgrace 7
THE WORLD FORESTRY CONGRESS — *Corydon Wagner* 8
CUTTING THE REDWOODS SELECTIVELY — *Emanuel Fritz* 10
THE REASONS FOR RESEARCH — *E. L. Demmon* 13
THE COLORADO RIVER STORAGE PROJECT — *Nello Cassai* 14
THAT FAMOUS CHERRY TREE — *E. John Long* 17
FORESTRY AND FISHING 18
PACIFIC SALMON, Self Perpetuating Resource — *Will Barker* 20
WINDWOOD FOREST — *R. E. Eshmeyer* 24
WETLANDS MEAN WILDLIFE 26
FORESTERS IN THE WATERSHED MOVEMENT — *H. G. Wilm* 28
THE LAKE MAN COULDN'T TAME — *Kwenlin Locke Eden* 31
KNOWING YOUR TREES: BLACK WILLOW — *Warren D. Brush* 34
LOGGERS AND LOGGING IN THE 1860's — *Allen Rivkin* 36
READING ABOUT CONSERVATION — *Arthur B. Meyer* 58
WHAT'S NEW ACROSS THE NATION 61

COVER: *Pacific salmon on the journey upstream to spawn. In some cases where dams have been built across traditional routes taken by the fish, ladders (upper photo) have been constructed to help them reach their destination.*

THE AFA

The American Forestry Association, publishers of AMERICAN FORESTS, is a national organization—independent and non-political in character—for the advancement of intelligent management and use of forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is to create an enlightened public appreciation of these resources and their part in the social and economic life of the nation. Created in 1875, it is the oldest national forest conservation organization in America.

Director of Advertising
Fred E. Hornaday

Production Manager
Geraldine S. Kirkland

Chicago Advertising Office
Harry W. Brown
333 North Michigan Avenue
Andover 3-7093

Western Advertising Office
McDonald-Thompson, 625 Market Street
San Francisco, 5, California, Yukon 6-0647

1008 Western Avenue
Seattle 4, Washington
Elliot 3767

3727 West 6th Street
Los Angeles 5, California
Dunkirk 7-5391

Colorado National Bank Bldg.
Denver 2, Colorado
Keystone 4-4669

3217 Montrose Blvd.
Houston 6, Texas
Lynchburg 6711

AMERICAN FORESTS is published monthly by The American Forestry Association at 919 Seventeenth Street, N. W., Washington 6, D. C. Subscription price $5 a year. Editors are not responsible for loss or injury of manuscripts and photographs while in their possession or in transit. The Editors are not responsible for views expressed in signed articles. Entered as second-class matter at the Post-office at Washington, D. C., under the Act of March 3, 1879. Acceptable for mailing at special rate of postage provided in Section 1103, Act of October 3, 1917, authorized July 10, 1918. Additional entry at Baltimore, Md., December 29, 1931. Copyright, 1955, by The American Forestry Association.

OFFICERS OF THE AMERICAN FORESTRY ASSOCIATION

Don P. Johnston • *President*
W. J. Damtoft • *Vice-President*
DeWitt Nelson • *Vice-President*
John M. Christie • *Treasurer*
Lowell Besley • *Executive Director-Forester*
Fred E. Hornaday • *Secretary*

BOARD OF DIRECTORS

P. R. Camp, 1955—Virginia, Camp Manufacturing Company.
Leonard G. Carpenter, 1955—Minnesota, President, McCloud Lumber Company.
Elwood L. Demmon, 1955 — North Carolina, Director, Southeastern Forest Experiment Station.
D. C. Everest, 1955 — Wisconsin, Chairman, Marathon Corporation.
Stanley G. Fontanna, 1956—Michigan, School of Natural Resources, University of Michigan.
Karl T. Frederick, 1955—New York, Chairman, State Conservation Council.
David V. Hagenbarth, 1957—Montana.
Katharine Jackson, 1957 — New Hampshire, New Hampshire Natural Resources Council.
George W. Merck, 1956—New Jersey, President, Vermont Forest and Farmland Foundation, Inc.
Robert W. Sawyer, 1957—Bend, Oregon.
H. B. Shepard, 1957—Boston, Forest Economist, Federal Reserve Bank.
Philip W. Smith, 1957—Pennsylvania.
Edward P. Stamm, 1956—Oregon, Vice-President, Crown Zellerbach Corporation.
James J. Storrow, 1956—New Hampshire, Society for the Protection of New Hampshire Forests.
George O. White, 1956—Missouri, State Forester of Missouri.

HONORARY VICE-PRESIDENTS

Horace M. Albright, Chairman, Resources for the Future, New York.
Herman Baggenstoss, Editor, *Grundy County Herald,* Tennessee.
G. Harris Collingwood, Legislative Reference Service, Library of Congress, District of Columbia.
Truman Collins, President, Collins Pine Company, Oregon.
Ivan C. Crawford, Director, Colorado Water Conservation Board, Colorado.
Mrs. Malcolm J. Edgerton, The Garden Club of America, Connecticut.
I. F. Eldredge, Consulting Forester, Louisiana.
Robert J. Filberg, President, Canadian Western Lumber Company, British Columbia.
Emanuel Fritz, Consulting Forester, California.
Walter C. Gumbel, Editor, *Journal of Soil and Water Conservation,* West Virginia.
Reuben G. Gustavson, President, Resources for the Future, District of Columbia.
G. B. MacDonald, School of Forestry, Iowa State College, Iowa.
G. W. E. Nicholson, Executive Vice-President, Union Bag and Paper Corporation, New York.
Lawrance W. Rathbun, Society for the Protection of New Hampshire Forests, New Hampshire.
Reuben B. Robertson, Jr., President, Champion Paper and Fibre Company, Ohio.
Paul D. Sanders, Editor, *The Southern Planter,* Virginia.
M. N. Taylor, Executive Director, Trees for Tomorrow, Wisconsin.
Lyle F. Watts, Former Chief, U. S. Forest Service, Oregon.
Peter F. Watzek, President, The Crossett Company, Arkansas.
Mrs. Marion T. Weatherford, Conservation Chairman, General Federation of Women's Clubs, Oregon.
Charles G. Woodbury, National Parks Association, District of Columbia.

Letters

Spread the Word

EDITOR:

I am especially pleased to renew my membership in The American Forestry Association.

AMERICAN FORESTS is one of the most refreshing and wholesome of all the magazines which we read. This magazine should be in every school library, Scouts, Campfires, etc.

We appreciate, too, the intense interest in conservation expressed in *Harper's* magazine by Bernard DeVoto.

"The Easy Chair," too, commands attention.

Mrs. Robert T. Lubbock
Cedar Rapids, Iowa

Christmas Tree Farmer

EDITOR:

I am enclosing a check for seven dollars which is final payment for my dues, and I regret not having gotten it to you sooner.

Thank you for sending the AMERICAN FORESTS magazine, and especially this month's issue. The article about the Christmas Tree Farmer was quite interesting and I'd like to see an article about Fred Halvorsen sometime. I understand he has quite a Christmas Tree business.

Hubbard Richardson
Springfield, Vermont

Links with Jefferson

EDITOR:

We have read with much interest the fine article by Mr. E. John Long in your November issue.

It is up-to-date, factual, and very well presented, doing full justice to Monticello.

Curtis Thacker
Superintendent of Monticello
Charlottesville, Virginia

Sacred Trees

EDITOR:

Reading the article "Sacred Trees" in your December issue I observed the statement "In the Middle Ages, it was believed that a child could be cured of rupture by passing it through a slit oak branch." Believe it or not, as Mr. Ripley would say, I received the "split tree treatment" for rupture when a child, and again, believe it or not, it appeared to work.

I have no recollection of the treatment, so everything I know about it was told me. When "about a year old" I fell from a balcony in my grandfather's house near Crawford, Georgia, and sustained a severe rupture. No time was lost in immediately summoning the Negro workmen with axes, wedges and mauls. A small young oak tree growing in the front yard was split open while still standing and I was passed through it.

Several months later the old family doctor stopped in and was told about it. He examined me and pronounced the rupture perfectly healed. He probably didn't believe what was told him and demanded to see the tree. When he saw it he almost fainted at the realization of what would have happened if a wedge had slipped out. Then, saintly old man that he was, he

Now...set fastening studs wherever they're needed
MODEL 450
REMINGTON
STUD DRIVER
Here's new economy...new speed in construction fastening! The Remington Stud Driver joins wood or steel sections to concrete or steel surfaces in seconds ...easily sets as high as 5 studs a minute. Powerful 32 caliber charges drive studs arrow-straight. The tool's light weight — only 5½ pounds — simplifies handling wherever studs are needed.
New guards for specific uses now make the self-powered Remington Stud Driver more versatile than ever. These attachments take all the guesswork out of stud location... assure fast, accurate fastening for every job. Illustrated are just 3 of these special guards.
A complete line of guards for special applications
Guard for "Unistrut Sections"
Guard for Switch, Utility and Outlet Boxes
Guard for Conduit Clip
"If It's Remington—It's Right!"
Remington
DUPONT

MAIL THIS COUPON FOR FREE BOOKLET

Industrial Sales Division, Dept. AMF-2
Remington Arms Company, Inc.
939 Barnum Ave., Bridgeport 2, Connecticut

Please send me my *free* copy of the new booklet showing how I can cut my fastening costs.

*Name*_____

*Position*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

made the air blue with indignant profanity.

Do not assume that my grandparents were ignorant and of a low social and economic order. They were both oldtime Southern aristocrats, highly educated, at the social top, and owning thousands of acres of land. Personally I attribute my recovery to my grandmother's skillful hands in reducing the hernia, and nature's way with the young.

I last saw the tree twenty years ago. Still standing, a magnificant specimen of nearly mature oak, both sides of the split still separate but healed with bark individually. I suspect I am the only living man in America today who received the treatment.

Aubrey Bray
Vicar
Holy Spirit Episcopal Church
Monterey Park, Calif.

Texas Situation

EDITOR:

I suggest that you have someone discuss the Texas National Forest issue who can approach the matter more objectively, and with less misinformation than H. H. Chapman seems capable of doing. I don't believe it's to the credit of your Association to publish MSSs that contain misinformation.

A. D. Folweiler
College Station, Texas

One for the Goose

EDITOR:

Perhaps the following is such an everyday occurrence it may bear little import, but I wish to thank you for the article in the past November issue "Playground of the Goose" by Hugo H. Schroder. Because of the valiant work Mrs. Lockhart Gaddy is carrying on for her late husband and the encroachments, the self-styled sportsmen are making to shoot down the Canadian geese she is mothering, I hope your article is copied or reviewed by sport magazines everywhere.

Such hunters to me are like the coyotes I heard one night molesting the wild geese feeding in the rice fields along the Sacramento river. Wild geese used to use the large bay (Malletts Bay) in front of my camp on Lake Champlain as a rest stop on their migrations but now yacht clubs, motor boats and ravenous hunters have driven them away. You can see how glad I was to read Mr. Schroder's defense and explanation of Lockhart Gaddy's Refuge and know where the geese winter.

I note the AFA stands for the "advancement of intelligent use of forests." A few years ago for a short period I bought and owned a 166-acre farm on Mt. Mansfield which the previous owner had stripped of timber, sugar bush (at one time one of the finest in Vermont) and nearly every worthwhile standing tree so I speak the language of conservation emphatically.

I shall be so interested to see more articles on the conservation of wildlife.

Dr. Grace A. Webb
Burlington, Vermont

Indian Acts

EDITOR:

As a reader for many years of your admirable magazine, may I call attention to what seems to me a serious error at the top of page 27 of the current issue (December), where in telling who Mr. Kinney is, you say "acts passed by the 83rd Congress to terminate, by 1958, all federal supervision over Indian affairs."

As a matter of fact several other acts were passed relative to small groups and tribes but there has been no wholesale legislation affecting all Indians in the U. S.

On page 53 it gives the number of enrolled members of the Klamath and Menominee tribes as 5160, whereas there are perhaps 275,000 Indians in the U. S.

To those who read Mr. Kinney's very able article, it will be evident that he is talking about those two tribes only, but many of your readers probably will read only page 27 and gain a wrong impression.

I agree with him in general as to those two tribes—as a matter of fact, as president of the Indian Rights Association, I testified before the Joint Committee, headed by Senator Watkins, in favor of the Menominee Bill, but I could not agree that "termination" would be wise for all of the 200 or so tribes and groups in our country. Rather, it would be very unwise for Indians and white folks.

I would be writing on Indian Rights stationery but I wanted to get this "kick" off to you promptly.

Jonathan M. Steers
President
Indian Rights Association
Haverford, Pennsylvania

EDITOR:

The long range plan to prepare American Indians for the responsibility of citizenship as described by J. P. Kinney in "Will the Indian Make the Grade?" was an informative and solidly-presented article. I will leave it to experts like Mr. Kinney to determine whether Indians are as yet equipped to manage their forest lands. To me, this article is another indication that Mr. Eisenhower means business when he calls for the elevation of so-called "second class citizens" to full citizenship status and responsibility. You do a service to the public when you present articles of this type.

Robert Curtis
Pittsburgh, Pa.

EDITOR:

Shame on AMERICAN FORESTS, a previously reputable journal, for running an article like that of J. P. Kinney in your Christmas issue. With one swoop, he and others like him would undo all the good work of Franklin D. Roosevelt and kick the poor Indians into the hands of unscrupulous interests.

(Mrs.) Elsie Johnson
New York City

EDITOR:

Authority or not, I say J. P. Kinney is entertaining dangerous ideas. He has more faith in state legislatures than I have when he says that the "Oregon law with respect to the management of privately owned forest land should operate to defeat any viciously destructive practices on Klamath forest land." I don't doubt that Mr. Kinney is a good forester.

Robert Ellis
Chicago, Illinois

Another "Statistic"

EDITOR:

May I add my two cents worth to the letter "A Statistic Talks Back" which appeared in your magazine.

I agree with the sense of that writer's letter. That's what I want too. A few years ago you ran a series on different kinds of insects that infest woodlots—that was very interesting and helpful to me. Incidentally, it led me to call in a professional tree outfit for assistance, if you are under any pressure from that direction *not* to run articles like that. The experience of the "Do It Yourself" development has been to create more work for the professionals, to handle the stuff that gets too complicated for the "Do It Yourselfers."

Anyway, my interest in AMERICAN FORESTS is from the point of view of the owner of a mixed stand of pine and hardwoods on an 11-acre plot. I want to keep it in beautiful shape, and I plan to plant more pine from the Wisconsin Conservation Department.

I liked your article in the December 1954 issue page 40 for the Woodlot Owner.

But the writer of the "statistic" letter said it better. Let's have more articles for us little woodlot owners.

A. J. Frank
Milwaukee, Wisconsin

Stanford Report

EDITOR:

Referring to the enlightening editorial in the November issue of AMERICAN FORESTS please let me hear how I may procure a copy of "The Stanford Report," covered in that editorial and in the splendid article in the same issue on the same subject.

Perhaps it would be better that I first read the 80 page digest and to procure the full Report later. Your name and that of Weyerhaeuser Timber Company are most familiar to me, going back as far as 1917 to 1921, over which period I was Secretary of Northwestern Lumbermen's Association, succeeding Willard Hollis.

I am delighted with the realistic approach to the subject matter of the Report, as sponsored by Weyerhaeuser. That the consumer angle must be paramount in the entire situation, has been my expressed conviction for some years. It is quite amazing that the rank and file thinking in our industry has been so reactionary as to this viewpoint, and that it is only now, under press of circumstances, that it is taking over to a measurable extent.

If it is in order, please let the Digest of "The Stanford Report" come along to me with any incident charge. With every good wish and with congratulations on the marked advance made by AMERICAN FORESTS typographically and as to truly informative readability, I am

Adolph Pfund
Oak Park, Illinois

Tree by the Tracks

EDITOR:

Our sincere thanks for the splendid story on the B&O holly tree written by Mr. E. John Long for your December issue. We fell sure that this well-written description of the big tree will undoubtedly draw many visitors next year from AMERICAN FORESTS' large readership.

Incidentally, you may be interested to know that recorded attendance at the tree in 1954 was 56,546—or almost double the attendance of 1953. This figure, of course, does not include the thousands who viewed the tree from our passing trains, indicating only the number of people who drove to the tree during the holiday season and signed the guest registers.

Virginia Tanner
Editor
Baltimore and Ohio Magazine

By ALBERT G. HALL

A VERY BROAD STATEMENT ON NATURAL RESOURCES contained in the President's State of the Union message to the 84th Congress will doubtless be interpreted in many ways by proponents and opponents of natural resource legislation during the year. Emphasis on the economic importance of natural resources, however, was quite clear. The President said: "At the foundation of our economic growth are the raw materials and energy produced from our minerals and fuels, lands and forests, and water resources. With respect to them, I believe that the Nation must adhere to three fundamental policies: first, to develop, wisely use, and to conserve basic resources from generation to generation; second, to follow the historic pattern of developing these resources primarily by private citizens under fair provisions of law, including restraints for proper conservation; and third, to treat resource development as a partnership undertaking—a partnership in which the participation of private citizens and state and local governments is as necessary as is federal participation."

THE PARTNERSHIP POLICY IN REGARD TO POWER DEVELOPMENT was further expanded upon by the President as being one to encourage local public bodies and private citizens to plan their own power sources. But, he also emphasized a federal obligation to undertake "projects of such complexity and size that their success requires federal development." So, we find that the broad policy on natural resources is broad enough to include all schools of thought; and it appears that conservation policy will be neither right nor left, so far as the Administration is concerned. Rather, it may develop into a program of first things first, with the method of approach being determined by the need and feasibility of the program.

A NATION-WIDE COMPREHENSIVE WATER RESOURCES POLICY, now in preparation, will be presented to the Congress, the President said, thus confirming the statements of Secretaries Benson, McKay and Stevens before the National Watershed Congress in December. The proposed policy is now being reviewed at the Cabinet level, and will be the subject of legislation to be introduced later in the year.

EXTENSION OF THE REORGANIZATION ACT, including continuation of the Commission on Organization of the Executive Branch of the Government (Hoover Commission) and the Commission on Intergovernmental Relations (Kestnbaum Commission) were strongly recommended in the State of the Union message. These two commissions expire this spring unless their tenure is extended by the Congress. Both are readying reports for early consideration by the President and the Congress. Because of the imminence of the Hoover and Kestnbaum reports, there appears to be little likelihood that action will be taken on any of the major legislation in the field of natural resources until after the reports are studied.

A SOLUTION TO THE PROBLEMS ATTENDING MINING CLAIMS ON THE NATIONAL FORESTS is again being sought by Representative Hope of Kansas. His bill, R.H. 111, is essentially the same as the one he supported last year. It would provide that only such timber as may be needed for development and operation of mining claims may be used by the claimant, but would provide also for his purchase of other timber on the claim. Use of the surface by the claimant for purposes other than mining activity would be prohibited. Briefly, the bill separates mineral from surface rights.

EFFORTS TO PROVIDE CONTINUING FUNDS FOR RECREATION AND WILDLIFE DEVELOPMENT on the national forests are being renewed. Senator Anderson of New Mexico has introduced

(Turn to next page)

S. 73, a bill to provide for setting aside 10 percent of national forest receipts, up to a maximum of $5,500,000 in any year, for development, maintenance and operation within the national forests of facilities and areas for public use. None of the fund thus established would be available for land acquisition. Similar bills in previous years have failed of enactment because they provide for side stepping the usual appropriations procedures. However, the interest in wildlife and recreational development on public lands is such that some provision for financing these activities is expected to be given favorable consideration by the 84th Congress. Representative Metcalf of Montana has introduced a bill that dove-tails with the Anderson bill; it would establish public use of the national forests as a policy of the Congress.

STATEHOOD FOR HAWAII AND ALASKA IS PROPOSED IN A NUMBER OF BILLS, but the one most likely to receive consideration is S. 49, introduced by Senator Murray of Montana and 26 other members of the Senate. This measure would establish statehood for both territories. Under the proposal, national parks within the two territories would remain under federal jurisdiction and ownership, as would also the national forests in Alaska. However, for purposes of furthering the development and expansion of communities, the state of Alaska would be granted up to 400,000 acres of national forest lands and 400,000 acres of other public lands. In addition, the new state would be permitted to select, over a period of 25 years, 100 million acres of public land for general development; 500,000 acres for legislative, executive and judicial public buildings; and 2,200,000 acres for other public institutions. For comparison: national forest areas in Alaska total over 20 million acres; public domain lands administered by the Bureau of Land Management include 40 million acres of commercial forest land and 85 million acres of woodland. Total area is more than 586,000 square miles.

A MISSOURI BASIN PROGRAM UNDER STATE COMPACTS is proposed by Representative Hope. His bill, H.R. 109, seeks the consent of the Congress for the negotiation of a compact among any six or more of the following states: Colorado, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Wyoming. Purpose is to permit the states to cooperate with each other and with the United States in programs of conservation and development of the land and water resources of the Missouri Basin through comprehensive, unified planning, development and operation of the resources. Such a broad program would have to be approved by the Congress and ratified by the legislatures of the states concerned before any action could be taken.

FEDERAL LANDOWNERSHIP AND ITS EFFECTS ON STATE AND LOCAL TAXATION is doubtless going to be given some attention by the 84th Congress. The Commission on Intergovernmental Relations has given the matter some study, and will make recommendations this spring. The General Services Administration is completing, at Congressional request, an inventory of federal real estate, by agencies. This inventory will be available in March. A number of bills have been introduced calling for review, study or adjustment of federal programs of payments in lieu of taxes on federal lands. Congressman Dies of Texas has reintroduced his resolution, H. Res. 26, proposing a special committee to investigate public property. The federal estate has grown sort of haphazardly as programs of conservation and defense, particularly, have been expanded. Lands and other properties removed from local tax rolls in some cases return more to the local governments through revenue-sharing payments in lieu of taxes than would have been realized by local taxation. In other cases, little or no return in lieu of tax equivalent is provided. In some areas federal forest ownership, for example, is studded with small areas difficult and expensive to administer. Boundary adjustments necessary to provide more economically operable forest areas are now being studied by the U.S. Forest Service. In other areas, it is contended that federal ownership hampers the extension of local and private programs of resource development and use. Within the government there is recognized a land-flow theory that contemplates increased government ownership in times of economic stress and decreased ownership at more prosperous times. This is the approach apparently being taken by the Commission on Intergovernmental Relations.

MORE AREAS FOR WILDLIFE REFUGES are proposed in several bills to amend the Migratory Bird Hunting Stamp Act so as to earmark not more than 40 percent of duck-stamp receipts for the refuge-acquisition program.

EDITORIAL

The Potomac River—a National Disgrace

Nearly1.7 million tons of Potomac River sediment and human waste that flow past the White House doorstep every year is a national disgrace. The status of this once-beautiful river and the land practices in the basin through which it flows are severe indictments of man's profligate use of his resources heritage. Nearly two-thirds of the Potomac River Basin's 9.3 million acres (14,500 square miles occupying parts of Maryland, Pennsylvania, Virginia and all of the nation's capital) have been damaged—some seriously—by improper land use. These unsatisfactory conditions on crop, pasture, forest and urban and suburban lands are reflected in part in the serious flood record of the Potomac and its tributaries, the extreme seasonal fluctuations in streamflow, the heavy load of sediment, and in the low economic returns from many farm and forest properties. The impaired values of tributary streams and uplands for wildlife, fish and recreation compound the effects of an unstable watershed situation. To make matters worse, heavy discharges of untreated or inadequately-treated wastes from municipal and industrial sources now spoil much of the river's usefulness .

The problem of the Potomac is not a new one. During the past 100 years, pollution, displaced soil from poorly-managed farms and butchered forests, and steadily-increasing flood damage have impelled state and federal authorities to take steps to alleviate the situation. Establishment and development of the George Washington National Forest following enactment of the Weeks Act in 1911, represented the first major step. Aware that healthy forests represent the first line of defense in the preservation of a basin's resources pattern, federal foresters tackled this problem at the headwaters where the floods start. The cooperative forest fire protection program inaugurated by state and federal foresters marked another important step. The first watershed control measures were launched by the Department of Agriculture under the Omnibus Flood Control Act of 1936. An important development in 1944 was the creation of the active Interstate Commission on the Potomac River Basin.

The combined efforts of all the groups working in the basin—foresters, Soil Conservation Districts, extension agents and citizens' groups—have accomplished much good. Nevertheless, the fact remains that the bulk of the task remains to be done. A resume of watershed needs as outlined at a recent Commission meeting by Assistant Forest Service Chief William S. Swingler underscored this fact. Too many corrective-type programs have been spotty and uneven, said Mr. Swingler. For example, within units for which watershed work plans have been prepared, 26 percent of the contour furrowing on 29,982 acres has been practiced. Pasture improvement has been undertaken on only 11 percent of 200,000 acres needing this work. Only four percent of the area (23,982 acres) in need of tree planting has been planted. Even less satisfactory is the progress in applying forest management practices on 176,361 acres in woodland. Here only one percent of the need has been met. On the whole, private non-farm forest areas are less depleted and unstable than the farm woodlands. Just the same, they too have suffered from over-cutting, improper road building and log-skidding methods to the point where flood runoff has been greatly accelerated. Present provisions for fire protection are quite effective in three of the states, but are lagging in the fourth. Forest management guidance is effective so far as it goes but has hardly begun to meet the needs. Strip mining in coal lands presents additional problems in flood runoff, sedimentation and stream pollution. Urban, suburban and industrial and similar developments constitute only five percent of the drainage basin's area but represent a serious and largely-neglected watershed problem. Untreated municipal and industrial waste that flows raw into the river at some points presents other watershed problems.

This is not a pretty picture and there is no use pretending that it is. Nevertheless, there are encouraging signs. The wave of national interest for applying package cures to sick watersheds everywhere is also gripping residents in the Potomac River Basin. Existing watershed councils are providing a hard core of action groups to which new recruits are rallying. More are being planned. One action agency is being formed to clean up Rock Creek watershed. Another has been proposed for either side of Long Draft Creek in Maryland's Gaithersburg region.

These developments are all to the good but more urban people must realize their stake in healthy watersheds and join in the effort. Of three million people now living in the Potomac Basin, over half reside in Greater Washington and several cities upstream. Any successful push for pure water in the Potomac must have the support of these urban populations. Thev must learn that the farmer, timberman and coal operator 200 miles upstream are their neighbors—neighbors with whom they must work and on whom their future welfare depends.

When our city people start coming out of their caves to start cooperative enterprises with their rural neighbors the task of cleaning up the poisonously foul Potomac River will be well on the way. And the time to start is now! The watershed "climate" nationally was never better. In Public Law 566 we now have a fine tool with which to implement watershed programs. All that remains to be done is to start practicing some real partnership in the Potomac valley.

The article on these pages was written on a plane bound from India to the United States. The author passed the flight time by putting down on paper some pungent reflections on . . .

The World Forestry Congress

WITH moods and thoughts shifting as rapidly as physical being in this flight around the world to attend a Forestry Congress in India, the consequence must be confusion. Now, while still in transit, and in the midst of these baffling experiences, to receive a request for an article on my experiences and impressions is, indeed, flattering. It is also a sobering tonic. I may not be able to shed any measurable amount of light, but I can surely diffuse and thereby, in part, dispel a great deal of my own confusion.

The site of the Fourth World Forestry Congress was well chosen. Dehra Dun is the location of a great forestry center which began with a school there in 1878. Impressive buildings make up an immense plant with a new main building adequate for the needs of such a large gathering. I understand this building was completed by the British just prior to their withdrawal. In this center is the Forest Research Institute with laboratories and pilot plants, the Indian Forest College, a forest ranger school, forest experiment station, nursery, botanical gardens, and arboretum. The National Defense Academy—India's equivalent to West Point, adjoins. Dehra Dun is in the foothills of the Himalayas, in an important timber producing area—long under management—thus an area for field studies is directly at hand. Incidentally, this is tiger country; successively the private hunting reserve of a Maharajah, the exclusive hunting domain of the British Governor General, and now a game sanctuary.

This Congress, the fourth, was of world scope in representation, to be sure. The approximately 400 delegates came from 50 countries plus four international agencies. I believe the total number attending was about equal to the Third Congress, held in Helsinki, Finland, in 1949, but at Dehra Dun many more countries were represented.

The Congress was in session for ten days, with plenary sessions at the opening and close, and, in between, discussions were promoted and guided through committees such as those on: 1) Forest Protection; 2) Forest Production; 3) Forest Products Utilization; 4) Tropical Forestry; and 5) Drafting of Resolutions.

No world-shaking pronouncements, such as came from the concurrent sessions of Messrs. Tito and Nehru in Delhi, emanated from Dehra Dun. Nor can they be expected from such a group. These forestry enthusiasts had certain interests in common, but circumstances, conditions, and opportunities for application of principles, vary throughout the whole possible range in the 50 countries represented. Discussions proceeded, but tediously, due to the demands of translating and attendant hobnobbing. Several pious platitudes were given to the press, but such have been known to escape from solemn gatherings in the West. The Delhi press reported such conclusions as: 1) research is a good thing; 2) there should be cooperation between agriculture and forestry; and 3) a degree of mechanization is desirable to raise production and consequently ability to pay a higher wage.

Since two-thirds of the delegates at least were from countries whose forests are tropical, that was the main theme. These world forestry congresses are called into being by the Forestry Division of F.A.O., — The Food and Agriculture Organization, a semi-autonomous offshoot of the United Nations. This explains the procedure whereby this Congress called on F.A.O. to:

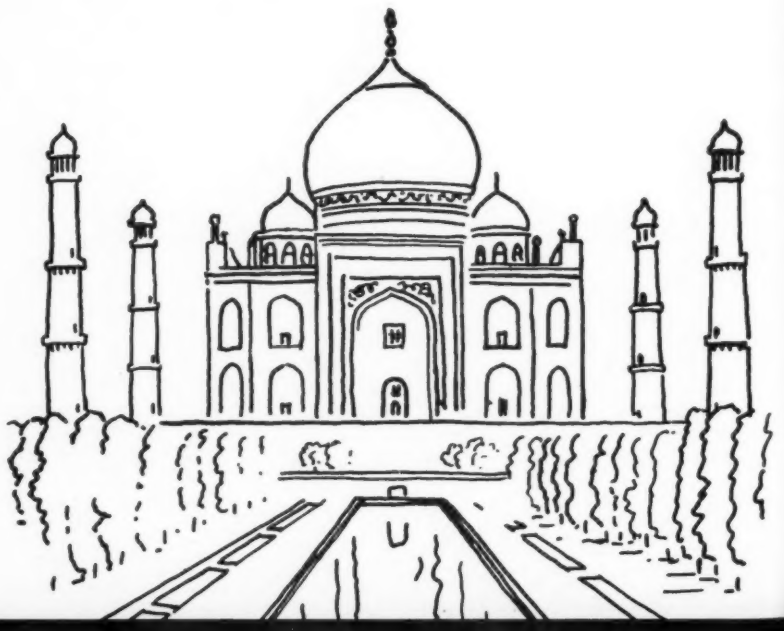
a) Collect and disseminate data from all contributing nations and agencies for silvicultural methods aimed at improving tropical forest stands.

b) Propose to all interested governments that an international commission be created on the control of deserts and on forestry in arid zones.

c) Stimulate research in utilization of tropical species.

d) Give increased attention to use of aerial inventory methods for tropical forests.

In all oversized gatherings, and most especially in the international field wherein the novelty brings added spice, there are dividends far richer than can be obtained from the formal presentations, discussions, and reading of technical papers. Exhibitions, demonstrations, motion pictures, entertainments, social contacts, and just ordinary "bull" ses-



Mr. Wagner, vice president of the St. Paul and Tacoma Lumber Company

By CORYDON WAGNER

sions despite lingual and ethnical handicaps, are the "stuff" from which indelibly fixed memories are made.

My first day at the Congress was eventful. I arrived late in the afternoon by motor (new Chevrolet) from Delhi. To find my billet in the gathering dusk was a feat in itself. Hostel Group—Block C—Room 14. This was one room of a long row of rooms or blocks of which there were several in parallel. All were of brick in the simplest style—I judged early primitive, (British Army style) i.e., shortly after Clive. During December the temperature range at Dehra Dun seems to be from 100° F. maximum to 32½° minimum each 24 hours. The maximum temperature prevails for one hour at noon, the minimum for the balance of the day. Brick, I discovered, is the perfect material to resist the warming effects of full sunshine and to retain the marrow-chilling dampness of the night atmosphere. My ten-by-ten billet was lit by one of Edison's Original Marvels—a single ten watt light, and here again British ingenuity had placed the one switch at the corner furthest removed from the bed. Nothing like a fast dash across the room morning and night on a concrete floor to circulate the few drops of blood that are still in liquid form. With this power, and water running through the grounds in a fast running irrigation ditch, these same distinguished military purists conceived the principle of the early morning bath for the Dehra Dun garrison. The practice still continues, as the 1954 veterans from Block C can testify. It brings into play a combination of characters: 1) yourself, the bather/victim; 2) a small galvanized tin tub on the cement floor; and 3) a motley supporting cast of three, consisting of your "bearer" or No. 1 man, who knocks on your door at 6:30 a.m. to announce the dawn of a new day, the sweeper who is attending the fire, and a water boy who carries to your door their combined product—a pail of hot water to entice you from the bed.

My seat in the mess hall a few hundred yards away was next to and elbow-touching with the delegation from U.S.S.R. This reminded me then and now of the awkward handling of Congress formalities by our own U. S. Department of State. At Helsinki in 1949 the U. S. had been represented by an official delegation led by the Assistant Chief of the U. S. Forest Service. When invitations to attend the present Congress were extended in the spring or summer of this year, arrangements were made for a large U. S. delegation, probably 27, to be led by the Chief of the U. S. Forest Service. Despite continual inquiry to determine the status of the delegation, it was not until the 19th of November that the decision was made public by the State Department that there would be no official U. S. representation. All of our governmental staff who had planned to go, and some were actually on the way, were withdrawn. Papers on technical subjects prepared for presentation to the Congress were also withdrawn. Our Indian hosts concealed their disappointment at this eleventh hour turn of events very well. The action was explained as being diplomatically necessary due to the fact that the government of India had extended an invitation to the government of Red China. The group of six Americans who registered for the Congress, therefore, were present only as individuals. It was suggested that we be meticulously correct in our attitude towards representatives of Soviet Russia, Red China, and the satellites. In case of certain developments, it would be proper to get up and leave. Here I was, then, rubbing elbows with the Soviet at my first appearance. There were six of their delegation at our mess. The nominal leader was a kindly looking elderly scientist of considerable fame, who obviously was a man apart from the rest of his group. A woman interpreter, who must have expressed in the course of the Congress more words than the combined total of the remaining 399, was the sub-commissar who wore the brass fixtures. The rest of this delegation were the type that has best been described by an eminent authority, U. S. General Mark Clark. It appeared that all of the delegates from behind the Iron Curtain were under strict discipline and instructed to avoid conversations with us. At one of the picnic luncheons, during a noonday lull on a field trip, I had a few words with a forester from one of the satellite states. He had noted my name and presumed I was German. It developed he had once been a top forest officer on a private property I had visited in 1937—had graduated from the Tharandt School, a pupil of Dr. Franz Heske.

On one of those very rare occasions when I happened to wander into the bar, which was conveniently attached to our mess hall, I found the British delegation playing three deep around the rail. At this very moment one of the dourest of the Soviets came in also from the opposite direction, and as luck would

(*Turn to page* 49)

California Redwood Association photos

Usable material is salvaged from debris left after selective cutting. This area was cut and logged in several rounds to reduce the breakage

Cuttingt

THE same factors that delayed the practice of forestry in other forest regions in the U. S. operated in the redwood region, plus others, particularly the belief that it takes a thousand years to mature a redwood tree. Yet the redwood region was one of the first in the U. S. to give serious thought to reforestation.

More than 40 years ago, during the "Eucalyptus boom," a half dozen of the principal lumber companies planted sizable portions of their cutover lands to blue gum (*Euc. globulus*). Then, from 1922 to 1930, more than one-quarter million dollars was spent on a large-scale planting project involving two large nurseries and several small ones for the rearing of conifer seedlings for transplanting to cutover lands. Both endeavors proved impracticable. Survival of planted seedlings was altogether too low.

The latest reforestation endeavor began in 1934, during the NRA days. It was based on a different system of cutting than the clear cutting then in vogue. It is called selective cutting. The first attempts were on operations using wire-rope systems of logging, whereby the log is pulled in a straight line to the loading point. Any tree left standing in the area was either badly scarred or pulled down. Nevertheless, it was found possible to leave fringes of seed trees and short sectors between the several positions of the main, or pulling, line. This was not enough for perpetual cropping requirements.

Fortunately, by the middle 1930's, the crawler-type tractor had been so well developed that it was found to be applicable to the steep redwood country and the very heavy, bulky logs. The real start of tractor logging was made in early 1935. From then on the old wire-rope system rapidly became obsolete, except in winter on a few operations because of local conditions unfavorable to tractors. But even here the steam donkey was displaced by Diesel engines and

Though redwood forestry is still far from perfection, substantial progress has been made in the 20 years since it was first started

g the Redwoods Selectively

By EMANUEL FRITZ

a "high-lead" rope system of relatively short reach.

The tractor can be described as a mechanized ox. Like the bull teams of the early days of logging, the tractor can weave in and out among the stumps and other obstacles. Trees intended to be left standing can thus be preserved.

An even more compelling force advancing the practice of forestry in the redwoods is the great change that has come about in the overall economic conditions. What was at one time impossible, or not worthwhile, is now good business. The possibility of utilizing woods and mill leftovers is a good example. Already a substantial beginning has been made toward utilizing mill odds and ends for pulp chips. These go to a hardboard mill, a container board plant, and to several roofing paper plants. But there is still enough more so-called waste for two or three additional fiber mills. Some mill leftovers are not marketable only because of their small and odd sizes. These are being re-assembled into clear, wide, long boards of more ready marketability. Any such utilization actually saves considerable standing timber and it takes some of the strain off the necessity for charging all the overhead to the traditional lumber product. This is an added incentive to the growing of trees.

Not the least important force is the realization that large reserves of old-growth timber are no longer available. At one time, a lumber company found it very burdensome to own and hold a sufficiently large area of old-growth timber for only a 20-year operation. While taxes, protection and other charges have increased very greatly, the returns from the mill products have also increased. At least such was the case during the past decade. Thus it became possible to build up reserves for reinvestment in old growth. But, since such timber is scarcer every year, there is now full realization that the cutting of old growth must inevitably come to an end and be followed by the cutting of young growth that has been deliberately grown for the purpose. Appreciating that a minimum of 50 years must be allowed, the initial steps have been taken to get the future crop started.

Lumbering has been going on in the redwoods for more than 100 years. Some of the redwood lumber companies are very old. A third generation of officials and employees is already involved in the operations and the fourth generation will soon be on the payrolls.

Plant and other investments are large. Their preservation, through continuity of operation, has actuated some hard thinking. Obviously, permanence of a lumber operation is contingent on a large log supply. To assure such a log supply in perpetuity and to make the old growth last as long as possible, selective cutting is gradually being refined; closer utilization is making further advances; forest fire protection is being intensified and studies are under way to determine more effective ways of making the older cutover lands produce somewhere near their potential of new tree crops.

The permanent lumber companies in the redwood region are of the integrated type. They own their own timber, do their own logging and log transportation, own and operate the sawmills and can turn out a completely dry and surfaced product ready for use. The addition of forestry departments and by-products plants makes the integration for perpetual production complete. The last named department is still young; its growth depends largely on the growth of markets.

The redwood forest is of a mixed size and mixed age class type. Trees range from one foot to twelve feet

View of a selectively cut redwood forest five years after logging showing ground cover of weeds, grass and young trees

in diameter and from under a hundred years to over a thousand years old. This forest characteristic indicates the type of cutting that should be followed. Obviously, some trees are under economical logging size. At the same time such trees, although already 200 or more years old, if left standing have the capacity of further growth. Indeed, and despite their age, the rate of growth is greatly accelerated once the original forest has been thinned of the mature and over-mature trees. These "residual," or reserved, trees serve also as a seed source for the natural reforestation of the gaps left by cutting. On the second round of cutting, a number of years hence, they will be considerably larger and will serve to sweeten the cut of young trees with top grade lumber.

At present, redwood foresters are thinking in terms of 75 to 100-year rotations. Actually when the original old growth is gone and new trees are to be cut, it is not unlikely that a shorter rotation may be the order. It is impossible and unnecessary to grow the fine grained lumber produced by the crowded old-growth trees. The job is considered to be one of producing fiber in huge volume. Lumber from fast growing younger trees is coarse grained, but technological advances have already shown that the fine-grained material is not at all essential, even though desirable.

To make perpetual operation possible it is imperative that there be control of a large enough annual supply of logs. And to make an operation economical of the trees and logs used, the plant must be large enough to justify the best and most effective machinery, the widest range of products and the closest utilization through by-products. Only a large area of timber can make such an enterprise possible. In the redwood region the actual *acreage* required is far less than it would be in regions of lesser yield per acre, but it still requires a large *volume* of timber. To hold such a body of timber while it is growing entails difficult problems of protection, administration, taxation and silviculture and therefore requires the greatest technical skill and a high order of managerial know-how. Such an area cannot be watched as closely as a home garden and consequently is subject to trespass, careless campers and hunters, and the depredations of natural enemies. One of the newer hazards is the black bear. This animal strips and kills many young trees and, if not controlled, will make permanent forestry in some localities of dubious feasibility.

At this point something must be added about redwood parks. There are now at least 72,000 acres of federal, state and private parks in the redwood belt. When the purchase program is completed the total will be near 100,000 acres. This will be more than 10% of the remaining stands of virgin redwood forest and more than 25% of the remaining timber volume. When the impounded moneys derived from tideland oil royalties are released, the acquisition program can be accelerated. The redwood forest is a remarkable forest over most of its range, but it is only on the stream benches and flats that it develops the eye-catching, awe-inspiring grandeur the public associates with the redwoods. It is these superlative areas that are being saved for posterity. The redwood forest, being of a climax type, will go on in these parks as it always has, without overall change but with almost unnoticed slow replacement in a natural way.

There have been many handicaps in the growth of the sustained-yield operation idea in the redwoods. For a while they were overpowering, but they have been all but overcome. The redwood forest has excited so much interest because of its grandeur, the great size, age and vitality of the trees, and the density of the stands that many legends exaggerate its attributes. So it has been with the redwoods. There are stories of trees 450 feet high, 30 feet in diameter and 8,000 years old. At one time it was a common belief that periodic fires favor redwood growth and that the trees can resist the hottest kind of fire. Some local people, blind to actual evidence of past fires, have argued that the redwood forest cannot burn. The first efforts at reforestation were ridiculed because "redwood grows too slowly" or because "redwood has no seeds and replaces itself only by sprouting." These fallacies were held not only by the general local public but by woodsmen as well. Actually, redwood grows slowly in the virgin forest only because it is crowded. Given the requisite space, it can grow with remarkable rapidity. The handicaps just given were local but important enough, if only because it is necessary to have the support of the local public before a venture like forestry can succeed.

The correction of the above-mentioned fallacies has been a time-consuming, often discouraging, job. But once the breakdown started, their utter collapse was inevitable. This collapse is being accelerated by such organizations as the Redwood Region Conservation Council, the Redwood

(*Turn to page* 44)

In this typical stand trees more than 40 inches in diameter have been cut and removed. Sprouts and seedlings are already in evidence

Mr. Demmon, who heads the Southeast Forest Experiment Station at Asheville, N. C.

Poor forest management, waste in the woods and at the mills, uncontrolled insect and disease attacks—these things are sapping the strength of our forest resources and are some of . . .

The Reasons for Research

By E. L. DEMMON

THE nation's forests represent one of our greatest natural resources, essential in maintaining our peace-time economy and our self-preservation in an uneasy world. Their wise management and use depends upon sound knowledge, best obtained through well-organized and effective research programs.

In the past America has often been wasteful of its forest resources. To our forefathers there seemed no end to the virgin forests. But today we find ourselves in need of more timber than we are growing. The area of forest land in this nation is about static. To meet increasing demands for forest products, we must practice better forest management on the lands we have and utilize more of the trees we harvest. Research is essential in attaining these goals.

Forest management practices have improved greatly in recent years, particularly on public forest lands and on some of the larger private holdings. But the forest lands in this country are still growing at only about one-third capacity; their output could be greatly increased under good management. Of all trees harvested, about two-thirds of the total volume is left in the woods or otherwise lost in the process of conversion to the final product. To overcome these deficiencies through better management and improved uses, sound technical knowledge supplied by research can play an important role.

The United States is unique among the countries of the world in the multiplicity of its forest types and conditions, and in its great range of forestry problems. During the last 50 years since the practice of forestry first got under way in this country, it has been necessary to build an American background of forestry knowledge not obtainable from Europe or elsewhere. During this period, research and experience have given us many sound guidelines for better forest management and improved wood utilization practices. But we still have much to learn in this respect.

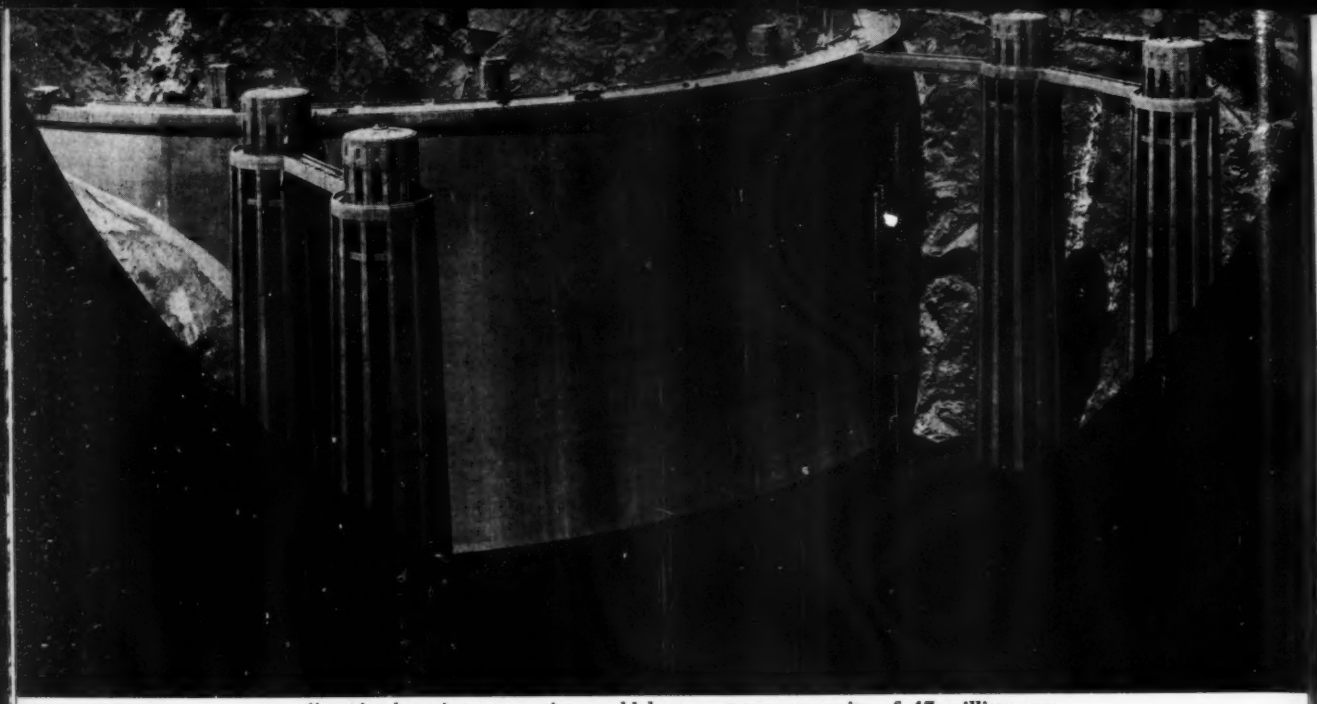
Prior to 1900 a few scattered forestry observations had been made and recorded in this country. Faculty members in departments of botany and horticulture at quite a few state universities and agricultural colleges contributed to this early-day forest research. The agricultural experiment stations were among the first to initiate work in forest research, and Ohio is to be complimented on the foresight of its agricultural experiment station administrators in that respect.

The federal government began a limited forest research program in the West in 1908, shortly after the U.S. Forest Service was transferred to the Department of Agriculture and given the task of administering the national forests. The Forest Products Laboratory, established by the Forest Service at Madison, Wisconsin, in 1910, has become the world's outstanding institution for the scientific study of wood and its uses. These federal research programs expanded very slowly until about 1928, when the McSweeney-McNary Forest Research Act was passed by Congress, providing a broad charter for federal forest research. Under its provisions the Forest Service set up 12 (now reduced to 9) regional forest and range experiment stations serving all the principal forest regions of the country; small forest research centers also have been set up in Alaska and Puerto Rico. These federal research activities concern problems of a national or regional nature, and those affecting the national forests with their 160 million acres of land in continental United States.

The regional forest experiment stations have developed their programs on the premise that the many phases of forestry are interrelated, and can best be solved by a well-rounded group attack. Accordingly, eight functional research divisions—forest management, range management, fire research, forest diseases, forest insects, watershed management, forest products, and forest economics (including the Forest Survey)—have been set up in the Washington office to guide and coordinate the work of the regional forest experiment stations. Several of these fields of forest research are concentrated at each station, assuring more effective administration and coordination with other research programs in the same region, and preventing unnecessary duplication of effort.

In the last few years the actual federal research programs have been developed largely at a series of about 60 field research centers. Each research center serves an area of several million acres of forest land having

(*Turn to page* 40)



Combined project reservoirs would have a storage capacity of 47 million acre feet, compared with 32 million acre feet impounded behind Hoover Dam, above

THE COLORADO RIVER STORAGE PROJECT

Controversies continue over this giant dream — and among the most bitter of these is that between the Upper Basin States and California

By NELLO CASSAI

IN 1847, the plodding Mormon followers of Brigham Young stopped on the immigrant trail and established Old Fort Supply in Wyoming as more imaginative explorers — fired by tales of sudden wealth and power — engaged in a mad rush for gold.

Wildly these gold seekers pushed on, sometimes marveling at the clear mountain streams of the West but often cussing these same raging torrents that stood between them and their promised riches.

It was desolate around Fort Supply but the Mormons needed food. Carefully they diverted water from Blacks Fork onto adjacent land. This probably was the white man's first large-scale irrigation project in the Rocky Mountain area.

A few years later, unsuccessful prospectors turned to farming in the high mountain valleys near Breckenridge, Colo., tapping the streams in primitive fashion to grow food for the mining communities.

Millions of dollars have been spent for irrigation, power and flood control projects of the West since that time.

But pending before Congress now is the giant dream of them all — a multi - million dollar undertaking known as the Colorado River storage program.

Dream or nightmare? Introduced in the 83rd Congress, it quickly split some of the very states it was designed to benefit. It drew fierce fire from California. For quite a different reason it kindled a blazing controversy within Colorado.

Conservation groups, with much of their strength in the East, flagged into opposing camps displaying a vigor never witnessed before. Senators and Congressmen from eastern states, many of them totally unfamiliar with the water problems of the arid West, were bewildered.

The bills containing authorization for the reclamation program were shelved. But the tumult continued. President Eisenhower himself, Colorado's most distinguished visitor, has been put on the spot in the nationwide debate, as has California's Vice President Nixon.

Battle lines are being drawn anew for another Congressional campaign and thousands of dollars are being poured into the fight on both sides.

Generating the biggest cry: Proposed Echo Park dam in Dinosaur National Monument, an awesome piece of real estate in the extreme northwest corner of Colorado.

The upper Colorado River states of Colorado, Wyoming, Utah and New Mexico have been convinced by the U. S. reclamation bureau—which planned the storage program —that Echo Park dam is a key unit of the vast undertaking, and they are determined to retain it in the first phase of construction.

Sportsmen and other nature groups, along with thousands of American city dwellers, warn that the entire project is doomed unless plans for the dam are dropped completely.

They say they want to preserve

the natural beauty of Dinosaur Monument and express fears that construction of a dam there by the federal government might open to exploitation other national parks and monuments.

Officials of California use this and other arguments for opposing the project. They charge, among other things, that upstream impoundments on the Colorado River will ruin the "quality" of their water.

But in Colorado there is more than a suspicion that California's real intention is to block water developments in the upper basin states so that California, with its growing population, can later claim a bigger share of Colorado River water which has not been put to beneficial use upstream.

To grasp the real meaning of the storage program, however, one must take a look at the Colorado River and go back into the records.

The turbulent Colorado originates in the state bearing its name and flows for 1700 miles within the United States and 50 miles in Mexico, where it empties into the Gulf of California.

With its tributaries, it flows through or forms the boundaries of Colorado, Utah, Wyoming, New Mexico, Nevada, Arizona and California. It is a vital water source for all the states within its basin, and is the only water source for large areas of Nevada, Arizona and Calfornia.

The basin of the Colorado covers one-twelfth of the entire land area of continental United States, 250,000 square miles. Much of this is arid, even desert country.

Without irrigation the West could produce few fresh vegetables, few sugar beets and few Rocky Ford cantaloupes or Palisade peaches.

Early settlements along the river were established in the valleys and desert areas where tributary waters and the main stream flow could be easily controlled and used for irrigation. The deeply entrenched sections of the river, typical of much of its course, could not be used without large and costly works.

The great development in the Imperial Valley and other irrigation projects in California and Arizona made increasing demands on the waters of the Colorado.

In contrast, the upper basin lagged far behind the lower basin in population increase and irrigation developments. An impending conflict between upstream and downstream use was recognized more than 30 years ago.

Thus in 1922 the states signed the Colorado River compact apportioning waters of the disputed river between the two basins, separated by Lee Ferry in northern Arizona.

Although 90 percent of the river's flow at the Mexican border originates in the upper basin, the lower basin (southern Arizona, Nevada and California) was assured 75 million acre feet of water in any 10 consecutive years.

The upper states (northern Arizona, Colorado, Wyoming, New Mexico and Utah) got the right to the remainder, assumed to be 7.5 million acre feet annually above Lee Ferry.

In 1949, the upper Colorado River basin compact was signed. It gave each state the right to use its percentage of the 7.5 million acre foot allotment.

These uses are to be in accordance with the states' own desires and water laws, but the obligation to deliver water at Lee Ferry remains a joint responsibility.

Streamflow records after 1922 demonstrated the need for large storage works on the upper river system, if the upper states were to utilize their share of the water.

At present these states have developments capable of using less than one-third of the water to which they are entitled.

The uneven flow of the river, with its erratic periods of drouth and flood, makes the fulfillment of the commitment to the lower basin and substantial development in the upper basin impossible without river regulation.

Reclamation bureau studies show that 42 percent of the upper basin's

apportioned water cannot be put to use unless excess waters are impounded during periods of prolonged high flows in a system of long-time holdover reservoirs for release during prolonged periods of low flows.

Several years of investigation and study were required by the Reclamation Bureau to explore potential developments. Working with the upper basin states and other agencies of the federal government, the Bureau presented a detailed plan in 1950. It was submitted to President Eisenhower on December 4, 1952.

Briefly, the Colorado River storage program calls for construction of nine major dams, reservoirs and power plants in the upper states—plus participating projects.

By the Bureau's own estimates, the initial phase would cost $925 million. Except for $28 million charged off completely to recreational costs, this should be repaid over a period of 50 years.

Power would return $547 million with interest at two and a half percent per year and also $270 million of irrigation non-interest bearing costs.

Users of municipal water would repay $45 million with interest, while other irrigators would return $35 million.

E. O. Larson, Regional Director of the Reclamation Bureau, testified at the Congressional hearings early last year that the estimated market demands for hydroelectric energy in the upper basin would require the total proposed installed capacity in all power plants within 20 years.

He offered exhibits showing that the storage program and participating projects would bring 295,000 new acres under irrigation in Colorado, Wyoming, Utah and New Mexico and would provide supplemental irrigation for 470,000 additional acres in those states.

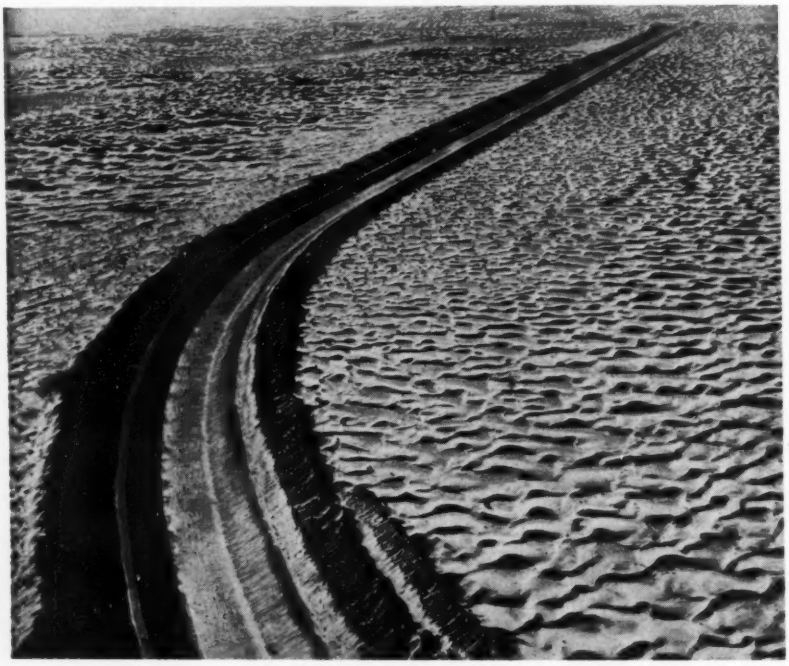
Generating capacity would be 1,378,000 kilowatts, while annual generation would amount to 6.5 billion kilowatt hours, and annual stream depletion would be 1,717,800 acre feet.

Although the undertaking was designed primarily for the upper basin, California and Arizona would drain off most of the power generated at one dam.

This is the proposed Glen Canyon project, about 15 miles upstream from Lee Ferry in northern Arizona. The power plant would have an installed capacity of 800,000 kilowatts, or roughly half of the total installed capacity planned for the entire undertaking.

Controversial Echo Park dam would be in Colorado, although its primary benefits would go to Utah. The site is on the Green River, a major tributary of the Colorado, about three miles east of the Utah-Colorado border.

Without irrigation canals like this one the West would have few fresh vegetables, few sugar beets or prize fruits



Its power plant would have a total capacity of 200,000 kilowatts, placing it second only to Glen Canyon.

The combined project reservoirs would have a storage capacity of about 47 million acre feet, compared to 32 million acre feet for Lake Mead behind Hoover dam, on the Colorado River downstream.

Larson told Congressional committees that the reclamation bureau had "painstakingly examined" many combinations of sites and that Echo Park is essential.

"Percentagewise, the evaporation losses from the remarkable storage vessel at Echo Park would be exceeded by those at all other sites possessing major storage possibilities in the upper basin," he said. "Echo Park reservoir is second only in size and importance to Glen Canyon."

The fight between conservation groups and backers of the project has received widespread publicity and it won't be rehashed here. However, the story of the reclamation undertaking cannot be told without delving into the battle between California and Colorado and the internal struggle within the latter state for water it produces in its snow-capped mountains.

The California - Colorado feud goes back a long way. It has manifested itself in various forms through the years, but it got down to a case of name-calling last winter.

In December of 1953, Gov. Howard Pyle of Arizona rushed to Denver to confer with Colorado's Gov. Dan Thornton in a secret mission.

Pyle and Thornton later told *The Denver Post* that the Arizona governor made the trip to warn Colorado of a California move to block the upper basin water development.

Pyle said an official representative of California, whom he did not identify, had approached him with an offer suggesting that Arizona and California settle their water differences and concentrate their efforts on grabbing more water from the upper basin states.

The Arizona governor said he turned the offer down flat. *The Denver Post* further quoted Pyle:

"More than once, those representing the Arizona position have been approached on the possibility of joining with California in an effort to take water from the upper basin.

"I assured Gov. Thornton and the Colorado River leadership of that state that Arizona is entirely sympathetic with the upper basin's posi-

(*Turn to page* 51)

Fact or fiction, the story of George Washington's exploits with a hatchet is one of our most familiar tales—

That Famous Cherry Tree

By E. JOHN LONG

WHILE it is neither the time of its flowering nor of its coming into fruit, the month of February is indelibly linked with the cherry tree.

And all because of a legend concerning the boyhood of George Washington, the first President of the United States, whose birthday we celebrate on February 22.

Again stores will display boxes of candied and chocolate-covered cherries, and ice cream makers and soda fountains will advertise their "Washington Birthday Specials" — cherry sundaes, cherry sodas, cherry ice cream hatchets and peaked hats, and even ice cream miniatures of G.W. himself.

How much fact and how much fiction is there in the famous "cherry tree story?" Scholars are still trying to find out. Historians on the whole are inclined to scoff at the tale as pure fancy. Those who do not scoff, term it a legend, harmless and perhaps salutary, but unsupported by any documents or other evidence.

A few grant that the incident might be founded on an actual incident in Washington's youth, for no other reason than not much is known of these important, formative years. Washington himself had little to say about this period in his life, or, at any rate, little has been found. Surviving letters, written by Washington before he was 23 years old, number only 35.

This much we do know about Washington's early boyhood — he moved about quite a bit. His parents lived in three different parts of Virginia before Washington had reached the end of his seventh year. George was born at Wakefield, on Pope's Creek, along the lower Potomac River, in 1732. In 1735, Augustine Washington, his father, took the family to his Hunting Creek Plantation (later called "Mount Vernon"). In 1739, the Washingtons moved again, this time to Ferry Farm, on the Rappahannock River, near Fredericksburg, Va.

Keep the time of the last move in mind, because it has a bearing on the location of the cherry tree incident—granting that it took place, of course.

It may seem hardly necessary to recount the details of the "cherry tree story," which are so familiar to every American school child. However, some modern history books either make no mention of it or dismiss it with a footnote. For such a healthy, well-established legend, this seems hardly cricket.

So, as the 252nd anniversary of the birthday of Washington approaches, perhaps it would be fitting to quote verbatim the brief passage that gave us what has proved to be the most popular of all stories about the Father of Our Country.

The "cherry tree story" originally appeared in a small volume called "The Life and Memorable Actions of George Washington," written by an itinerant preacher and book peddler named Mason Locke Weems, better known as Parson Weems. Weems learned what people liked to read from selling books of all kinds. While his biography of Washington is no literary masterpiece, it went into a total of 70 editions, no small feat in itself in an age of hand presses. It probably did more to shape the present-day heroic conception of Washington than anything that has been written before or since.

Now don't waste a lot of time trying to find a first edition of Weems' "Washington," which hit the bookstalls in 1800. Although it had a fairly good sale for those days, it has not too much value today, except as a curiosity. There is no mention of the cherry tree story in this, or in the three editions that followed it. Finally, in the fifth edition (1806), seven years after Washington's death, the story appears.

As Weems describes it, the incident was related to him by an "excellent lady" whose name he does not reveal. Here is the quotation from Weems' text:

"The following anecdote is a case in point. It is too valuable to be lost, and too true to be doubted; for it was communicated to me by the same excellent lady to whom I am indebted for the last.'

" 'When George,' said she, 'was about six years old, he was made the wealthy master of a *hatchet!* of which, like most boys, he was immoderately fond, and was constantly going about chopping every thing that came in his way. One day, in the garden, where he often amused himself hacking his mother's peasticks, he unluckily tried the edge of his hatchet on the body of a beautiful young English cherry-tree, which he barked so terribly, that I don't believe the tree ever got the better of it.

"The next morning the old gentleman, finding what had befallen his tree, which, by the by, was a great favorite, came into the house: and with much warmth asked for the mischievous author, declaring at the same time, that he would not have taken five guineas for his tree. No-

(*Turn to page* 53)

● Good forestry—good fishing

FORESTRY AND FISHING

WATER doesn't burn. Yet a single match, misused, can destroy your fishing. Fire can change a clear, cool, even-flowing stream into a muddy, raging torrent after heavy rains, and a dry river bed during times of drought. In forested areas, what we do to the woods may decide your angling success.

The soil is really a reservoir. Water is stored between the soil particles. The soil can store most of the rainfall. Some of this water in the soil is used by the trees and other vegetation. Some emerges as cool springs —as "leaks" in the huge reservoir.

If the rainfall runs off the land, instead of soaking in, the soil reservoir gradually loses its water. There is less moisture for the trees and other plants. The flow of springs diminishes, or stops entirely.

Except during periods of rain, or fast-melting snow, the streams receive all of their flow from "leaks" in the ground-water reservoir—the flowing springs. If the springs go dry, the stream goes dry, too. Fish can't live in a dry stream bed. Their food can't grow in a dry stream bed, either.

Rain, when it reaches the ground, will either soak into the soil or run downhill to the nearest stream. If most of it rushes to the stream, the water will overflow the banks. There will be floods. Floods destroy property. They harm fishing, too, by destroying fish food and fish habitat.

So, it's all-important that much of our rainwater soak into the soil. If most of it runs off the land, our streams will be flooded at times, and dry at other times. They will not be suitable for fish life.

How much of the rain soaks into the underground reservoir depends on the cover on that reservoir. On a bare hillside, most of the water will run down the surface. If a sponge is placed on this hillside, to hold the water until it can percolate into the soil, very little water will run off; most of it will soak into the sponge and on into the soil.

In the forest, Mother Nature provides a sponge. The leaves fall from the hardwoods each fall; pines and other conifers lose their needles little by little, too. In time, the leaves decay, forming a thick layer of humus on the floor of the forest. This humus is an excellent sponge. It holds lots of water, gradually letting it pass into the reservoir below.

Forest fires burn the sponge as well as the trees. They destroy the all-important rain-collecting roof to the underground reservoir. With the humus destroyed, much of the rain will run downhill. The streams will be flooded during heavy rains, and will be dry during periods of drought.

Lumbering, properly conducted,

need not destroy the ability of the soil to absorb water. We can cut the mature trees without destroying the humus sponge. From the standpoint of fishing, the leaves which have fallen for centuries on the forest floor, and decayed there, are more important than the trees themselves. Young trees, growing in place of the mature ones which were cut, drop their leaves, too. We can harvest the timber of the forest, and still have good fishing streams.

The forest affects the water temperature, by shading the stream. The amount of water which soaks into the soil affects the stream temperature, too.

Each species of fish has its own temperature needs. Trout want cold water. Smallmouth bass want cool water. Largemouth bass want warm water. If the temperature is too low, the fish become sluggish; they don't eat enough food to grow on. If it's too high, they die.

The cool springs tend to have a fairly even temperature. When their flow is reduced, the water in the stream in summer is warmer. A good trout stream may become too warm to support trout, or a smallmouth bass stream may become too warm to support these fish. The springs not only furnish the water for the streams, but they affect the temperature of these habitats for fish.

There's another important reason why most of our rain must soak into the ground. If it rushes down the hillsides instead, it carries some of the soil with it. This silt destroys the food of the fish, and muddies the water. The topsoil, which is badly needed on the land, harms the fishing when it washes into a stream. Water which flows from springs is clear. It carries some plant nutrients with it. These enrich the water. They make it possible for food organisms to grow. But, water flowing from springs also leaves the soil behind, on the land, where it belongs.

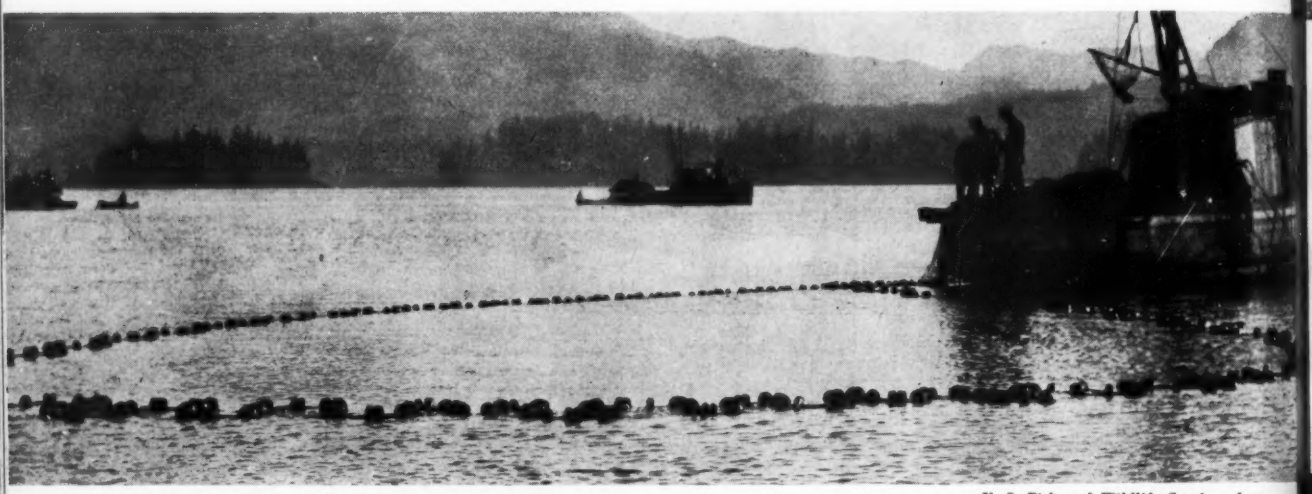
So, in wooded country, what we do to the forest affects your favorite outdoor sport. Remember — with good forestry we can have good fishing; but, poor forestry means poor fishing.

● **Poor forestry — poor fishing**

One of the wildlife planks in AFA's Program for American Forestry recommends "integration of wildlife management practices with those of forestry on forest lands." Why good forestry and good fishing go hand in hand is explained with unusual clarity in the above article written by Dr. R. W. Eschmeyer, of the Sport Fishing Institute. The first in a series now being prepared by the Institute on fishing and how good or poor land practices affect it, "Forestry and Fishing" reprints will be distributed to thousands of high schools across the country. Articles now in preparation by Dr. Eschmeyer, all of which will be sold in lots for the approximate cost of printing, include "Grazing and Fishing," "Municipal Water Supplies and Fishing," "Farming and Fishing," "Roadbuilding and Fishing," "Municipal Sewage and Fishing," "Industrial Sewage and Fishing," "Industrial Pollution and Fishing" and "Municipal Pollution and Fishing."

Pacific Salmon

Self-Perpetuating Resource



U. S. Fish and Wildlife Service photos

Purse seining in Alaska, a common way of capturing the salmon

By WILL BARKER

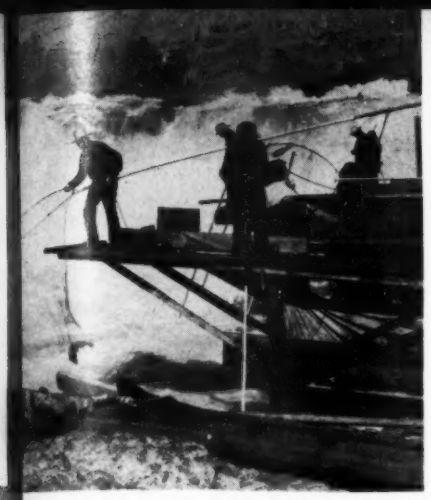
ORIGINALLY the salmon of the Columbia River represented a wild crop harvested by man where he had not sown. The coming of the salmon on their spawning migrations was the most important event of the year for Indians throughout the watershed of the Columbia. From the foggy lower reaches of the river to its mountain-high tributaries a thousand miles from the ocean, various tribes took about 18 million pounds of salmon each year. Though this catch was substantial, countless salmon of all species escaped the Indians' dip nets to reach the spawning grounds and were adequate brood stock to maintain the resource in plenty forever.

But the arrival of Lewis and Clark in the Pacific Northwest in the early 1800's was the beginning of the change that was to come in the life pattern of the Indians. At the time the explorers were in the area, on the last lap of their journey down the Columbia in search of the Pacific Ocean, the "Everywhere-Salt-Water" of the Indians, there were about 50,000 native North Americans in that section of the country. By 1850, there were only 20,000, due to decimation as a result of various diseases brought to the West by white settlers.

The remaining Indians continued to fish for themselves and for the settlers at ancestral fishing sites like Celilo Falls. But as the country of the Columbia River system was developed during the next century to meet the needs of its swelling white population, the salmon fishery declined—a fate similar to that of the other fishery resources in the nation and the fate of the wildlife resources, too. This general decline in our self-perpetuating resources was a result of changes in land and water use, brought about by the tremendous increase in our population. From 1850 to 1950 our population jumped from about 25 million to more than 150 million.

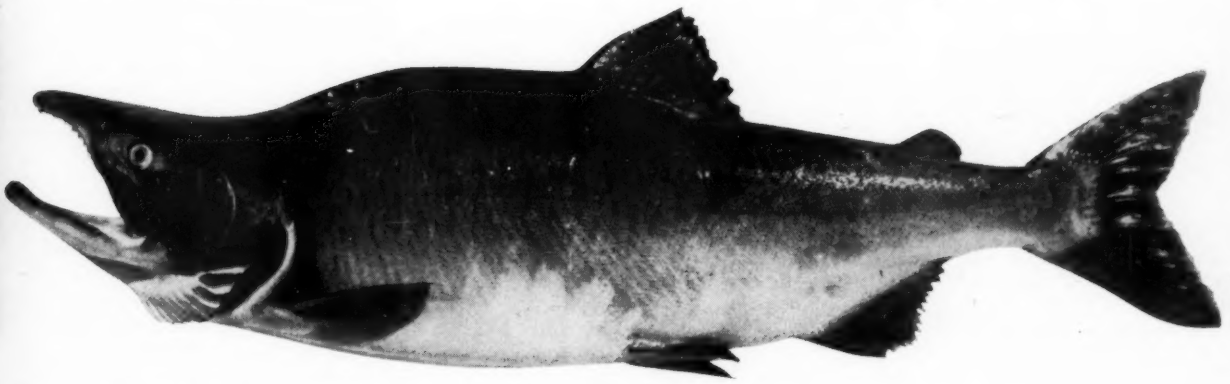
With this sixfold increase came pollution of streams, rivers, and lakes, deforestation and the resulting soil erosion, floods and droughts, and obstruction or destruction of spawning areas through damming or flooding. Great hydroelectric, reclamation, flood control, and navigation developments, as well as soil conservation projects, were responsible, too, for the decline in the fisheries, particularly those inland. Such projects cause drastic changes in physical and biological environments on entire river systems. One development, among others, made just such a change on the Columbia River, where the annual salmon catch of nearly 32 million pounds has a value of 17 and a half million dollars.

Construction of Grand Coulee Dam across the main stem of the Columbia River created a serious problem concerning the salmon spawned in the upper reaches of the river. The dam, a high one with a tailrace-forebay difference of about 300 feet, blocked access to hundreds of miles of shallow streams, with



Indians at Celilo Falls, Oregon fishing for salmon with hoop nets

Changes in land and water use brought about by the tremendous increase in our population have made it tough sledding for the salmon industry



Chinook salmon in a hatchery pool

clear, cold water and many graveled stretches. Such streams are the type of habitat liked by the species of Pacific salmon that spawn on the Columbia River.

After Grand Coulee was built, the Fish and Wildlife Service undertook to preserve the upper-river salmon by transplantation — putting hatchery-reared fingerlings in four tributary streams entering the Columbia below the dam. After more than ten years of such plantings in the Wenatchee, Entiat, Methow, and Okanogan Rivers, successful runs of blueback and chinook salmon have been established. In fact the number of blueback salmon now returning to the Grand Coulee project is considerably greater than the number ascending the Columbia to that area before construction of the dam, and the spring chinook has been maintained.

The chinook and blueback salmon spawning on the tributaries of the Columbia below the obstruction to ancestral spawning areas are two of the four species of salmon that spawn in the river and its many tributaries. In all there are five species of salmon indigenous to the waters of the west coast of North America. They are the king or chinook, the red, sockeye, or blueback, the silver or coho, the pink or humpback, and the chum, keta, or dog. All belong to the genus *Onchorhyncus* of the family Salmonidae (salmons and trouts).

All these five species of salmon occur also in the western Pacific, generally from Kamchatka to the island of Hokkaido in northern Japan. A sixth species (*Onchorhyncus masu*), known as masu in Japan, is found from southern Japan northward to the Island of Sakhalin. The masu is an important commercial fish in Japan, but is less valuable than any of the five American species. All Pacific salmon are anadromous; that is, they start life in fresh water, grow to maturity in the ocean, and return to fresh-water streams to spawn. All die soon after spawning, whereas the Atlantic salmon (*Salmo salar salar*) may spawn more than once.

Of the Pacific salmon spawning on the Columbia River, the king or chinook salmon (*Onchorhyncus tshawytscha*) is the most important, and ranges on the American side of the Pacific from Monterey Bay, California, to the Yukon River in

Alaska. Sixty one percent of the 1951 United States-Alaska pack of canned chinook salmon was from the Columbia River. And since the life history of the chinook is, in most respects, similar to those of the various species of Pacific salmon, it has been chosen as representative.

The chinook—common name for this species from the Columbia River south—is the first of the salmon to enter the rivers in the early spring, but the spawning migrations are distinctly separated into spring and fall runs, and sometimes a summer run is considered to exist. The spring run consists of the most desirable fish, that enter the rivers in the spring of the year and ascend farthest upstream.

A chinook salmon matures at sea, where it spends from three to five years, feeding on candlefish, herring, and other small species as well as some of the larger plankton organisms. By the time it feels the urge to return to the stream in which it was spawned, the average adult chinook on the Columbia weighs from 20 to 22 pounds and measures about 36 inches in length. It is a beautiful silvery fish with a metallic sheen, and the upper part of the body is dotted by small dark spots, that are numerous on the caudal and dorsal fins.

Upon entering fresh water, a chinook stops feeding, though being one of the principal sport species among salmon it may strike at a lure and may be caught by casting, spinning, or trolling. Such a strike is probably motivated more out of annoyance than for any other reason. For sustenance on its long up-river journey, a spring chinook depends on the nutrients in body fats and tissues stored during its voracious feeding at sea. These same body fats and tissues also provide for the reproductive products of both the male and the female, though those of the male are usually fully developed when the male enters fresh water, whereas the eggs of the female become "ripe" or mature at about the time it arrives at the spawning area.

Salmon on the journey upstream near Brooks Falls, Alaska

Once a chinook starts its migration up the Columbia, it travels at a rate of three to ten miles a day, or sometimes even more. In the larger streams of Alaska, a chinook may spawn at the extreme headwaters of a river — 1500 miles or more from the ocean. Before construction of the first big dams, like Bonneville, Grand Coulee, and Rock Island, on the Columbia, spawning migrations of a like distance were common. Despite the popular belief that an adult salmon can leap vertical distances of ten or more feet, waterfalls of such height generally block upstream migration of most salmon. Even a waterfall of five or six feet will stop many, unless water-flow conditions are just right. Fish ladders for salmon at dams rarely require the fish to leap a vertical distance of more than two feet, and most ladders are so adjusted as to permit the fish to swim rather than jump a rise of about one foot.

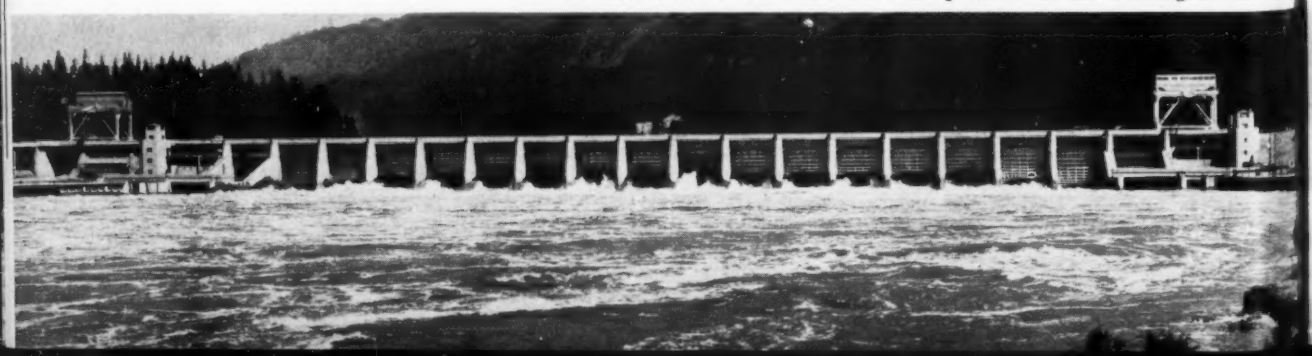
A chinook salmon that manages to escape all the natural and man-made hazards of its long journey, arrives at its destination looking like a caricature of the fish that left the ocean, perhaps a hundred days before. Its body is long and slim, its jaw hooked, and its silvery color is dull and covered with blotchy patches of near-black. Although it appears to be in poor physical condition, the spermatozoa or milt in the body of the male is fully mature and ready for fertilizing the eggs of the female.

On the upstream migration, a chinook travels quite independently, though in the company of many salmon of its own and other species. Now on the spawning gravel of a little stream that meanders through a mountain meadow, dotted by clumps of sagebrush and small stands of pines, it selects and remains close to a female that is preparing a nest or redd in the gravel at the upper end of a riffle. By violent flexions of her tail the female rolls sand and gravel and larger stones out of a hollow in the stream bed. These are carried by the current slightly downstream.

During the preparation of a nest by a mate, a male chinook maintains a position a short distance to the side and downstream. Frequently it chases away other males and trout from the area, and often, in turn, is chased away if it approaches the working female too closely. When the nest is completed, the female settles into the hollow, where she begins new flexions to assist in the extrusion of eggs. The male moves into a position alongside its mate and at the moment that a group of eggs issues from the vent of the female in a pink burst, the male expels from his vent a small white cloud of milt. Eggs and milt settle to the bottom of the nest among the stones. Each egg is fertilized by the entrance into the egg of a single sperm.

When the first spawning is com-

Bonneville Dam, with fish ladders in operation on the Washington side



pleted, the female moves forward to the upstream edge of the nest and starts digging again. The dislodged gravel and rocks settle downstream over the recently deposited eggs. Again the two salmon spawn in this newly prepared section of the nest. This procedure is repeated for several days until all the eggs, about 5000, have been released by the female, fertilized by the male, and covered with gravel.

After the final spawning, both male and female are greatly emaciated. Their skins are torn and scratched, fins and tails are shredded and white, and patches of fungus have started to form on dead tissues. They maintain equilibrium with great difficulty. In a week's time, the current rolls them over and over, and they gradually drift downstream, making sporadic efforts to right themselves. A few days later, the lifeless fish lodge among boulders on the bottom of the stream, their mission accomplished, their lives completed.

The bodies of these two salmon, like all those of the other spawning fish in the area, provide food for minute animal life in the stream, which, in turn, becomes food for the spawners' offspring when they emerge from the gravel in the following spring.

An egg, deposited and fertilized by the two spawning salmon the previous fall, lies almost a foot down in the gravel of the redd, through which there is a good flow of water. As the early spring sun warms the water, the embryo that is to be a chinook salmon develops rapidly. Sometime in March, after twisting violently for days, the embryonic salmon breaks the egg shell with its tail, and with a few additional wriggles is free—a translucent fry about three-quarters of an inch long. It is not yet able to swim, so for nearly three weeks it subsists on the food supply in the yolk-sac attached to the underside of the body. When the food is nearly used up and the fry is much stronger, it works its way up out of the gravel.

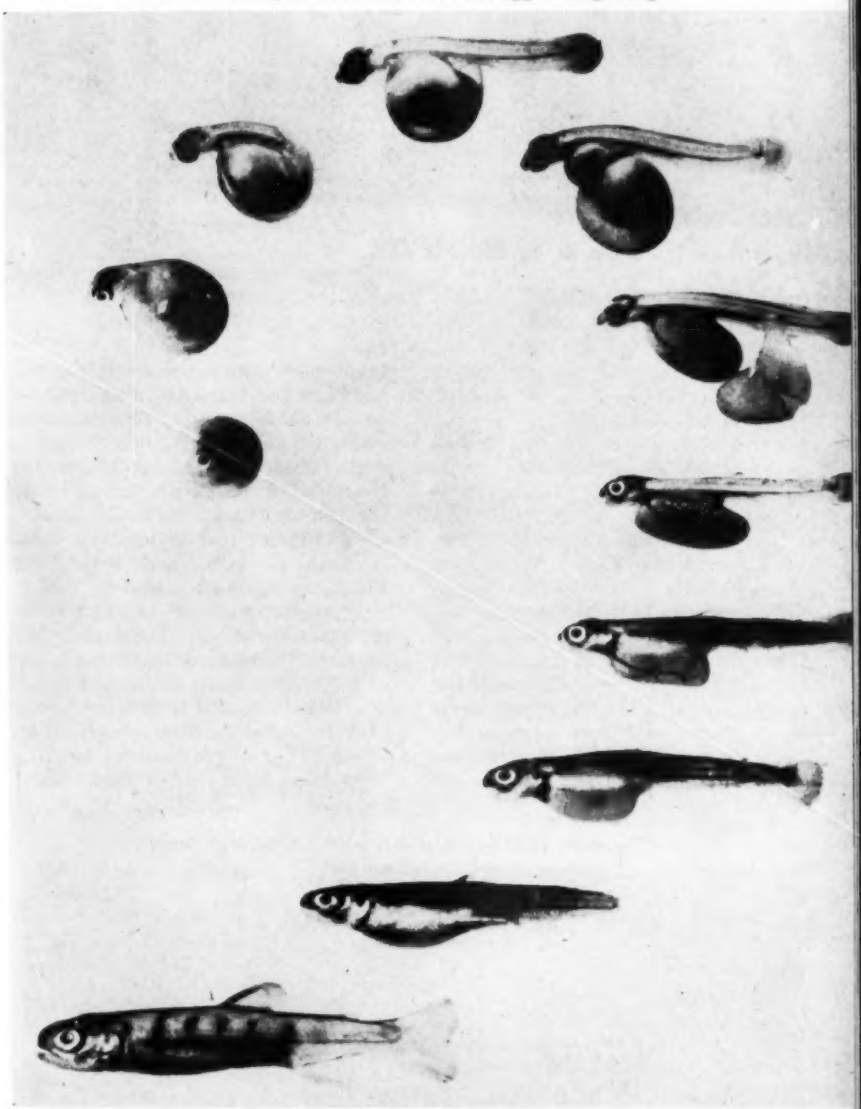
Once free, the little salmon and all the others that emerge from the gravel at about the same time, look for food. As the days pass and the water continues to warm, the fry feeds on organisms carried to it by the water and often goes after them itself. Chironomids — mosquito-like flies or midges — are its first food, and later nymphs of various water insects, like May flies, that hatch successively through the spring and early summer. As it gains in size and ability, the young chinook ventures farther and farther from the safety of the spawning bed in search of food, but it is always on the alert for trout and herons and kingfishers and other predators.

In search of food, the chinook fry drifts with the current of the stream in which it was spawned, and so drifting and feeding starts a downstream course that eventually ends in the Columbia tidal area. Here there are organisms brought down by the river and new foods brought in from the ocean by the tides. With so much food available, a young chinook grows rapidly, and when it is about five inches long, it puts out to sea—a leave-taking that is almost two years after the pair of chinooks that were its parents entered the Columbia on their upriver spawning migration.

The life cycle of a chinook on the Columbia River is typical of the way in which the five species of Pacific salmon have been perpetuated for centuries in the thousands of streams entering the North Pacific. Fortunately, during the past 50 years, the salmon fishery has been stabilized to some extent, principally by regulation to permit the escape of enough salmon to reproduce. In spite of dams, water diversions, and pollution, enough of the industry remains to bring in millions of dollars a year and to provide employment for thousands on the Columbia River alone.

(*Turn to page* 55)

Here is development of fish from the egg to fingerling



For many years buried by sand dunes to the very tops of its trees, a once-virgin land is coming back from the grave. Michigan natives call it . . .

Windwood Forest

By R. E. ESHMEYER

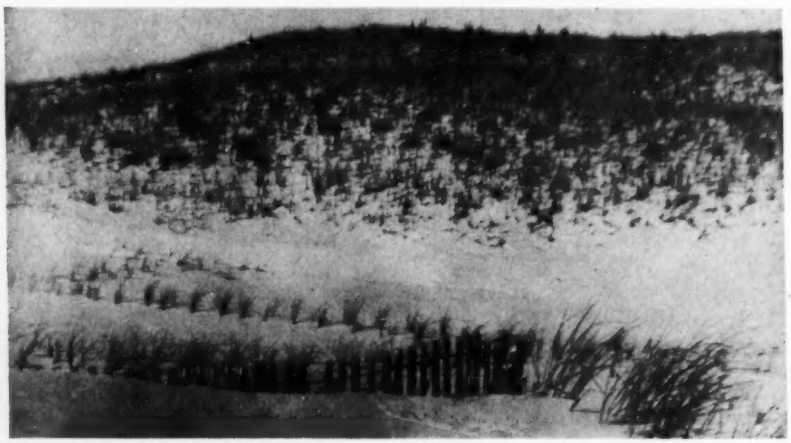
ONCE upon a time, long before the coming of the white man, Windwood Forest was like any other forest of conifers, hardwoods and a variety of other common trees found in the Silver Lake region at Mears, Michigan. In fact there's a virgin forest nearby which is a perfect commentary on what Windwood Forest was like.

Windwood Forest has been coming back from a grave. For many years it was buried by sand dunes to the very tops of its trees! Although the dunes are still uncontrolled, they never again could bury a forest. Because their movement is so very slow, there is ample warning and time enough to take protective measures.

It was the Indian who let it happen in the first place. Broken pieces of Indian pottery have been found in spots where Windwood Forest has been uncovered all the way down to the original floor, where the sand is of a different tint and where water —which is on a level with Lake Michigan—can be found.

If an expert were to compare a cross-section of one of the old pine snags in Windwood Forest with one of a living pine in the virgin forest nearby he'd be able to date the burial of Windwood more accurately than by merely saying it happened before the coming of the white man. Some think that the wild powers of the dunes were unleashed because too much timber was cut away. But that theory can't hold, for Windwood Forest would not be there now had anyone been interested in saving the timber when it was first being threatened.

Unlike snow, sand is not always halted by a drift fence



Dr. James P. Orwig of Michigan State College, has spent much time at Windwood nearly every year since his early childhood—when he and another boy were on a hike and spent a night at Windwood because the old pine knots they found there made a fire that was fun to watch.

Orwig named the forest Windwood. Through the years he met many people who came there, usually by way of the dunemobile or by wading through Silver Creek, to pick up bits of highly-prized driftwood, which is of a special hardness as well as of strange design. The dunemobiles still come and folk still gather driftwood.

"It really couldn't be driftwood," Orwig explained, "because it certainly never drifted. The element in which it was emersed did the drifting, while the wood itself was completely stationary."

Nothing could be more simple. "An example of driftwood," he explained, "is a piece of wood let go, let's say, at the West Indies. It traveled down to our shores by way of the Gulf Stream. It encountered many rough coral reefs. It was sand-

blasted time and again, and bleached by the sun, getting picked up finally by a beachcomber and sold to a Florida greenhouse."

There is another form of driftwood, however, which is also in great demand, and that's old pine roots that have been submerged in water for many years. This has the texture and hardness of "windwood." Perhaps it should be called "waterwood." Anyhow, the quality of the wood found at Windwood is unexcelled.

Orwig has never found anything but pine in Windwood Forest. Neighboring live forests have some red cedar, an abundance of white cedar, white pine and hemlock. None but the pine has stood the test of time in Windwood Forest. No hardwoods show up and no traces remain of any of the softer types of wood.

Orwig has found trees which were nearly but not completely buried, a few of the upper branches remaining to face the weather.

Seeing new trees partly submerged now does not impress one until he becomes conscious of 1500 and more acres of sand dunes moving with the slowness of the minute hand of a clock. When one suddenly gets a vision of the whole picture the impact is tremendous. The dunes then appear to be some huge monster moving across a forest, devouring everything and replacing the landscape with its huge, naked body!

Whatever the story may be regarding the dunes' release of wild, ravaging power, there is one theory which is plausible about their movement: they cut a bay off Lake Michigan to make Silver Lake, which is one of the most beautiful in the state. Since the dunes never succeeded in cutting off that lake's connection with the mother, or larger one, Silver Lake keeps itself stocked with fish right out of Lake Michigan.

Nothing can hold the dunes. Drift fences are soon covered up. Dune grass—Artemesia grass, named after a goddess because of its simple, strong beauty—does little good too, although much of it is at the moment flourishing over a large part of the dunes.

Silver Lake was once oval and is now kidney shaped because the dunes are moving in. Perhaps Silver Lake will one day be filled up and that may be the permanent halt of the wild sands.

Cabins have been covered up. One man went to court for not paying taxes on property destroyed by the dunes. He pled his own case successfully on the proposition that no man can pay taxes on what no longer exists. Others have had to move their cottages farther back and there are some now that are in danger.

The state of Michigan owns 1500 acres of these dunes. Each year they are leased to an operator of dunemobiles or dunescooters, which the same man has offered the public for 21 years. For $1.50 he will give you a nine-mile trip over that hilly, trackless waste.

The dunescooters are specially built, heavy automobiles with two sets of wheels front and back. Only six pounds of air in the tires makes for good traction in the sand. They climb the highest dune and come straight down on the other side in perfect safety.

Most interesting to the nature lover is the course of short Silver Creek. Its struggle will become harder with the years and some of its present beauty spots will become as common as wet sand. Whatever happens and when is as predictable as the winds, and that glorious virgin forest which still thrives a stone's throw from the shifting sands will probably be cut down in another decade!

Span shown here crosses Silver Creek and is called Termite Bridge. Photo below that of bridge shows Dr. James Orwig, Michigan State College professor, and his collection of pine knots from Windwood Forest

WETLANDS MEAN

Photo by W. J. Mead

Share trapper with Fish and Wildlife Service permit sets one of his traps

Baling part of the government's share of muskrat pelts at the Seney Refuge

Photo by W. J. Mead

Closeup view of muskrat house about four feet high at Tule Lake, Calif.

Fish and Wildlife Service photo

SINCE the late 1800's some of the best areas in the nation for migratory waterfowl, fur animals, and other wildlife species have been subjected to drainage schemes to reclaim the lands for farming. Much of this land was unsuited for agriculture and after a period of trial and error, during which our wildlife resources dwindled alarmingly, the value of wetlands for the production of wildlife was recognized to some extent.

Recognition came through the establishment of national wildlife refuges like Seney in upper Michigan, Horicon in south central Wisconsin, and Lower Souris in north central North Dakota. These refuges restored ancestral breeding grounds or resting and feeding areas for migratory waterfowl and provided habitat for fur animals and other wildlife species liking a wetlands environment. Although Seney, Horicon, and Lower Souris and other Fish and Wildlife Service refuges for migratory waterfowl have done much to save some lands from civilization's encroachment, their combined acreage of three and a quarter million acres is not sufficient to carry the present populations of wild ducks and geese.

A minimum of 12 and a half million acres is needed. The Fish and Wildlife Service needs another four million acres to complete the federal refuge program, and the states need about five million acres of waterfowl lands to round out the necessary acreage.

Recognizing this great need for

(*Turn to page* 43)

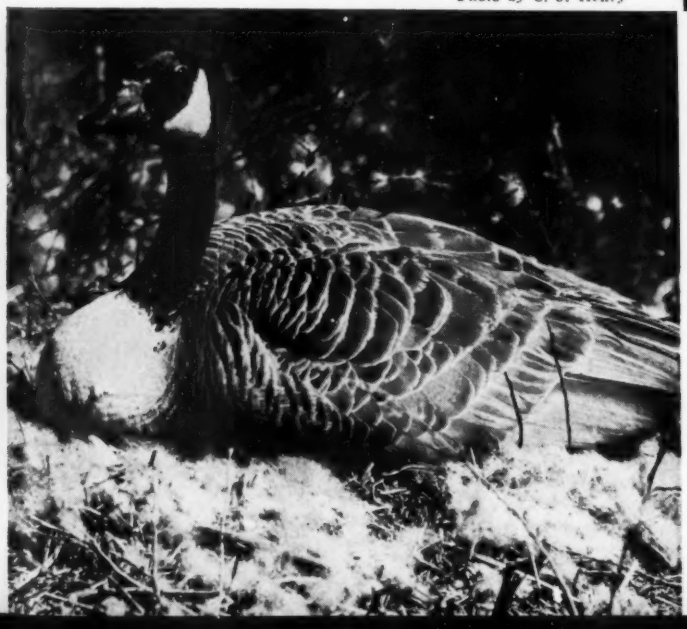
Canvasback duck nest

National Wildlife Week March 20-26 will spotlight the need to save our wetlands

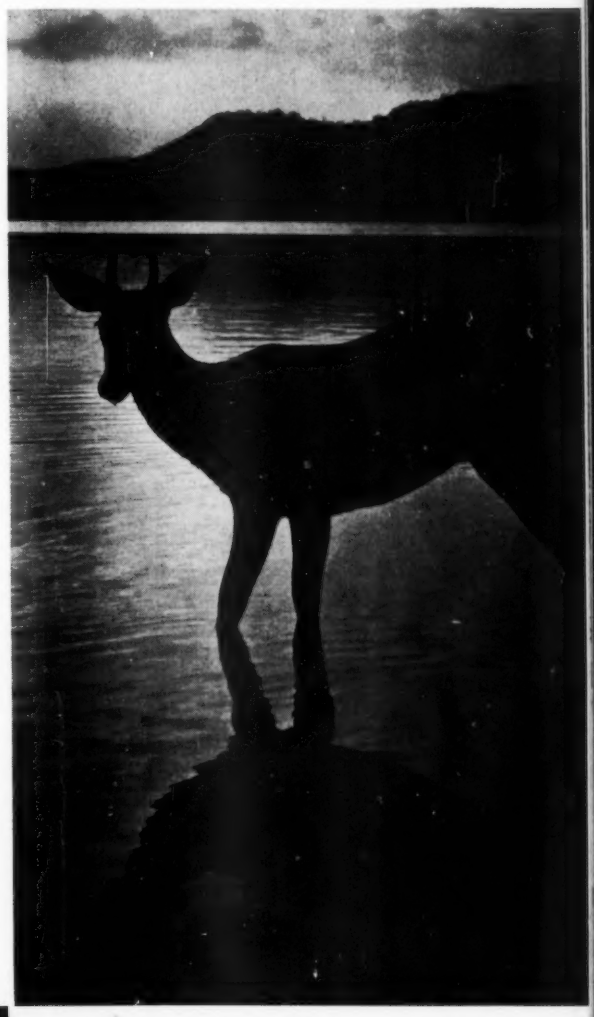
N WILDLIFE

Concentration of waterfowl at Sacramento National Wildlife Refuge
Fish and Wildlife Service photo

Canada goose on nest at Seney Refuge, Germfask, Michigan
Photo by C. J. Henry



Vermont whitetail deer about to quench its thirst



Opening day of fishing season on Wichita Mountains National Wildlife Refuge
Fish and Wildlife Service photo

FORESTERS IN THE

According to the author, one important factor was lacking in the recent National Watershed Congress held in Washington, D. C.—the active participation of foresters

By H. G. WILM

THE National Watershed Congress, held in Washington, D. C. in December of 1954, was well attended and successful from many viewpoints. The formal participants and many in the audience took an active and interested part in discussions of the ten committee reports which were the main subject matter of the Congress.

To a forester, however, one important factor was lacking in the Congress: the active participation of other foresters. Apparently the Watershed Congress was not widely publicized among foresters, and as a professional group they were not specially invited to attend. This is a matter of real concern, because the background and future implications of the Watershed Congress are of vital importance to American forestry, and to the owners of forest and range watershed land throughout the United States.

To support this assertion it is necessary to develop some of the background of the Watershed Congress, and suggest what it may mean to forestry. First we might mention the purpose of the Congress: to organize thinking and planning for the development of small watershed projects on a national basis; more specifically, to serve as a springboard for the development of nation-wide activities under the "Small Watershed Act," Public Law 566, which was passed in 1954. These small watershed projects must involve foresters, because the watersheds of a large part of the United States include substantial areas of forest and range as well as cropland; and therefore watershed improvement must include work on forest and range lands.

The objectives of the Congress were attacked through 10 technical committees, the titles of which give an excellent picture of the scope of work of the Congress: 1) Elements of a sound national land and water policy; 2) Review of existing and needed federal legislation; 3) Review of existing and needed state enabling legislation for the creation of watershed districts; 4) Development of adequate state agencies; 5) Federal appropriations; 6) Federal, state and local cost sharing in watershed protection and development; 7) Principles of federal inter-agency coordination; 8) Local administrative techniques; 9) Public understanding; 10) Organization of watershed associations. It is noteworthy that the 87 committee participants included less than 10 professional foresters and men especially interested in related fields such as wildlife and recreation. As developed from discussions during the Congress, a number of other committee members as well as men in the audience expressed their interest in forest and forest land development as an integral part of small-watershed de-

Visit to watershed near Florence, Italy convinced Mr. Wilm that good forest management forms keystone of the watershed movement

velopment. Still, the dominant themes of the Congress were the development of agricultural land and the establishment of small flood-control engineering works. Even more, these themes were determined by leaders of the National Association of Soil Conservation Districts, who came from the non-forested prairie belt of states.

To see how these concepts affect foresters and forest land, let us look at the development of the Small Watershed Act. In principle this law represents a useful forward step in a new and significant movement in conservation. It is the direct response to a tremendous upsurging of public feeling as to the need for watershed improvement.

This feeling has grown from the perennial distress caused by floods, erosion, and sedimentation on the small watersheds of the United States. Over the last decade or so, people have begun to realize more

Watershed of Monte Morello, once denuded of its forests

E WATERSHED MOVEMENT

and more that relief from these problems along the smaller streams cannot be achieved by large flood-control structures on the main rivers of the country; but that their solution can be found only through flood-prevention work on lands and in the channels of the smaller watersheds themselves. These thoughts have led to the coalition of little groups of people, more or less formally organized, at many points in the country—each group with the desire to improve watershed conditions in their own local area. Often the organizations have stemmed from local soil conservation districts and have been encouraged by the Soil Conservation Service. But in every case they are composed of people who live within a single watershed—below a single drainage boundary, drained by a single system of streams —small enough so that the residents can see each other's problems and want to do something about them in an organized manner. The improvements contemplated include work on agricultural land and in stream channels—terracing, crop improvements, drainage, small dams and streambank revetments, for example. They may also include work on forest and range land, such as tree planting, fire protection, fencing, seeding, and grazing control.

The sentiment for this kind of activity on small watersheds has grown with surprising rapidity. During the last few years it developed to such a point that, when Congressman Clifford R. Hope of Kansas asked the United States Congress for five million dollars with which a number of "test watersheds" could be established, the money was appropriated for fiscal year 1954 with hardly a question. Then the next logical step was Public Law 566. When this bill was introduced by Mr. Hope and Senator George D. Aiken of Vermont, it received much support and substantial opposition; and in its final form it does not wholly satisfy either its proponents or its opponents. At any rate, it provides a real mechanism through which local groups of people can undertake watershed improvement work, with the assistance of the federal government.

Quotations from the law will give a more complete picture of its function:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That erosion, flood-water, and sediment damages in the watersheds of the rivers and streams of the United States, causing loss of life and damage to property, constitute a menace to the national welfare; and that it is the sense of Congress that the federal government should cooperate with States and their political subdivisions, soil or water conservation districts, flood prevention or control districts, and other local public agencies for the purpose of preventing such damages and of furthering the conservation, development, utilization, and disposal of water and thereby of preserving and protecting the nation's land and water resources.

SEC. 2. *For the purposes of this Act, the following terms shall mean:*

The "Secretary"—The Secretary of Agriculture of the United States.

"Works of Improvement" — any undertaking for —

1) flood prevention (including structural and land-treatment measures) or . . .

2) agricultural phases of the conservation, development, utilization, and disposal of water . . . in watershed or subwatershed areas not exceeding 250,000 acres and not including any single structure which

Southern Pine Association Lists Program for April 4 Convention

QUALITY improvement and cost reduction today are top priority projects for the Southern Pine industry, and accomplishments along these lines — present and potential — will be officially aired when the 40th Annual Convention of the Southern Pine Association gets underway in New Orleans on Monday, April 4, according to S. P. Deas, secretary-manager of the Southern Pine Association.

Progress in the field of mechanical efficiency will receive special attention. Major technological developments and other measures which helped produce a five percent increase in demand for Southern Pine lumber in 1954 will be reviewed. The best tools in the industry's arsenal will be on display at a mammoth Logging and Sawmill Machinery Exposition to be held at New Orleans' Municipal Auditorium.

New ideas, new techniques will be presented for the benefit of all connected with the construction, building supply and wood working industries.

Business sessions will be conducted at the Auditorium for the convenience of delegates. These will be limited to one hour each and there will be only two a day — one in the morning, the other in the afternoon. The short sessions will give delegates ample opportunity to watch the numerous demonstrations the Exposition will offer.

Business sessions, Deas said, would be in the nature of panels with a qualified chairman and ample opportunity for a question and answer period. Questions remaining after the one-hour limit will be attended to through the mails. A tentative schedule already has been prepared and Deas said that all subjects listed are of definite and immediate concern to all who will attend.

On Monday, April 4, the closely related topics of forestry and logging will be considered. The considerable progress in forest management and improved mechanical efficiency which have resulted in an increasingly favorable balance of growth to removal, will be reviewed, and the forest potential analyzed.

Sawmilling, planing and drying are on the program for Tuesday, April 5. Precision equipment capable of machining lumber to patterns and shapes requested by customers will be discussed, along with modern dry kilns. Some of these machines will be on display at the Machinery Exposition and representatives of the producing companies will be on hand to explain this operation.

Although the Southern Pine Association has held previous Machinery Expositions, present indications are that the one forthcoming will be the most spectacular yet. The machinery will be assembled from all parts of the United States, and a few items will come from abroad. Whenever possible, action demonstrations will be conducted. Some examples of the types scheduled for exhibition are as follows:

1) An automatic scarf and finger joint machine for gluing short stock and gang ripped low grade material into long lengths. Material fed into this machine is end-jointed and up-graded. It will completely assemble scarfed and short stock into random lengths and cut the glued up material to any given length continuously and automatically up to 16 feet long.

2) Debarkers which help make possible 100 percent log utilization.

3) New and spectacular electronics equipment.

provides more than 5000-acre feet of total capacity. . . . A number of such subwatersheds when they are component parts of a larger watershed may be planned together when the local sponsoring organizations so desire.

"Local organization"—any State, political subdivision thereof, soil or water conservation district, flood prevention or control district, or combinations thereof, or any other agency having authority under State law to carry out, maintain and operate the works of improvement.

SEC. 3. *In order to assist local organizations in preparing and carrying out plans for works of improvement, the Secretary is authorized, upon application of local organizations. . . .*

1) to conduct such investigations and surveys as may be necessary to prepare plans for works of improvement;

2) to make such studies as may be necessary for determining the physical and economic soundness of plans . . . ;

3) to cooperate and enter into agreements with and to furnish financial and other assistance to local organizations . . .

4) to obtain the cooperation and assistance of other federal agencies in carrying out the purposes of this Section.

In principle this law is sound; and its provisions are broad enough to provide for the needs of all interested persons, including owners and managers of forest and range land. If there is any serious defect in the development of the small-watershed movement up to now, it lies in the comparative lack of participation of foresters in the selection of demonstration watersheds and of areas which would be sponsored by local organizations for work under Public Law 566. It is not easy to get quantitative figures on these points. But several comments are pertinent:

1) The National Association of Soil Conservation Districts has listed over 10,000 small watersheds that need treatment for soil and water conservation and upstream flood prevention. More than half of these are in the prairie and lake states. The remainder is well distributed over the United States, including the major areas of the Southeast, Northeast, and Northwest where forests and range lands exert a dominant influence on watershed conditions. It is not known how these watersheds were named, but it seems doubtful

(*Turn to page* 47)

For a quarter century North Carolina's Mattamuskeet Lake has defied man's repeated efforts to conquer it

The Lake Man Couldn't Tame

By KWENLIN LOCKE EDEN

IT's fabulous but it's true. For 25 years man tried to conquer Lake Mattamuskeet and failed. Man was so intrigued with the idea of draining the lake and establishing on the beautiful rich soil of its bed the world's greatest farm that $17,000,000 went into the effort. The lake grew bigger than ever and wildlife was even more abundant after each attempt.

Mattamuskeet is in the low-lying flat lands of Hyde County near the town of New Holland, North Carolina. It is the largest natural lake in that state. Composed of 30,000 acres, it is one of the greatest wintering grounds along the Atlantic coast for thousands of waterfowl, principally Canada geese, ducks and whistling swan.

The lake is in the heart of a 50,000 acre National Wildlife Refuge. Thousands of visitors come each year to fish, hunt, and observe the wild creatures. The lake is a sluggish body of water more than 15 miles long and five or six miles across. The average depth is two to three feet. Three feet below sea level, the lake catches the drainage of the surrounding countryside where there is as much as 60 inches of rainfall during the year.

There are cypress trees along the northern border and low swamplands on the eastern and southern shores. A highway crosses the lake on a broad causeway.

Mattamuskeet is the Indian name for "Great Dust." Legend has it that the lake originated indirectly as a result of a prolonged drought. It is said that the Indians built ceremonial fires to appease the rain gods and succeeded only in angering them into letting the ground itself blaze for more than 13 moons. One day an Indian maid asked for the gods' mercy. In answer, they sent rain for many days that left a broad inland sea where game was plentiful again.

Other more realistic beliefs are that the lake bed was made when a shower of meteorites struck the coastal plain and that the natural depression used to be an arm of the sea. The U. S. Geologic Survey inclines to the theory that the natural origin was once a juniper swamp.

More than 100 years ago man first dreamed of draining the beautiful lake. In 1909 a start was made but the money ran out and the project was halted. In 1915 another attempt was made. A huge pumping station was set up on the south shore of the lake and a new community arose on

(*Turn to page* 56)

New Method Revolutionizes Loading Logs Onto Rail Cars

INTERNATIONAL TD-18A crawler with Log Rack lowers freight charges, takes 2 less men, unloads trucks six times faster for Montana logger

Rossignol Logging Co., Missoula, Montana, made four different time-saving improvements in their log-loading operations by switching from a skid-mounted stationary loader to an INTERNATIONAL TD-18A crawler with Log Rack.

Here's how the 89 drawbar horsepower TD-18A with Log Rack that lifts 9,000-pound log loads revolutionized the Rossignol operation:

1 **REDUCED MANPOWER 66%** as the new method is a one-man operation compared to the loader operator and two tong-setters formerly needed.

2 **UNLOADS TRUCKS 83% FASTER,** requiring but 5 minutes compared to the 30 minutes needed by the old loader. Time lost under old method was even greater if second truck came in while first was being unloaded.

3 **NO TRUCK TIE-UPS** at the siding since the new loader simply unloads trucks and stockpiles logs when no railroad car is available. Old loader had to unload trucks and transfer logs directly onto flat cars.

4 **DEADLY THREAT** has been completely removed from releasing hold-down chains on haul trucks —an operation that used to be the most deadly in logging. Now the loader steadies logs above the stake while the chains are released in complete safety.

Production on this logging operation 60 miles east of Missoula averages 60,000 bd. ft. daily and all of the logs cut and trucked each day are loaded onto railroad cars by the INTERNATIONAL loader in six hours or less.

Take a long look at your mechanization set-up and you'll find where one of these INTERNATIONAL units can offer multiple improvements. See for yourself by calling your INTERNATIONAL Industrial Power Distributor for your demonstration. Log Racks are available for INTERNATIONAL TD-6, TD-9, TD-14A and TD-18A crawlers. Name the one you want to see in action and he'll demonstrate at your convenience.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

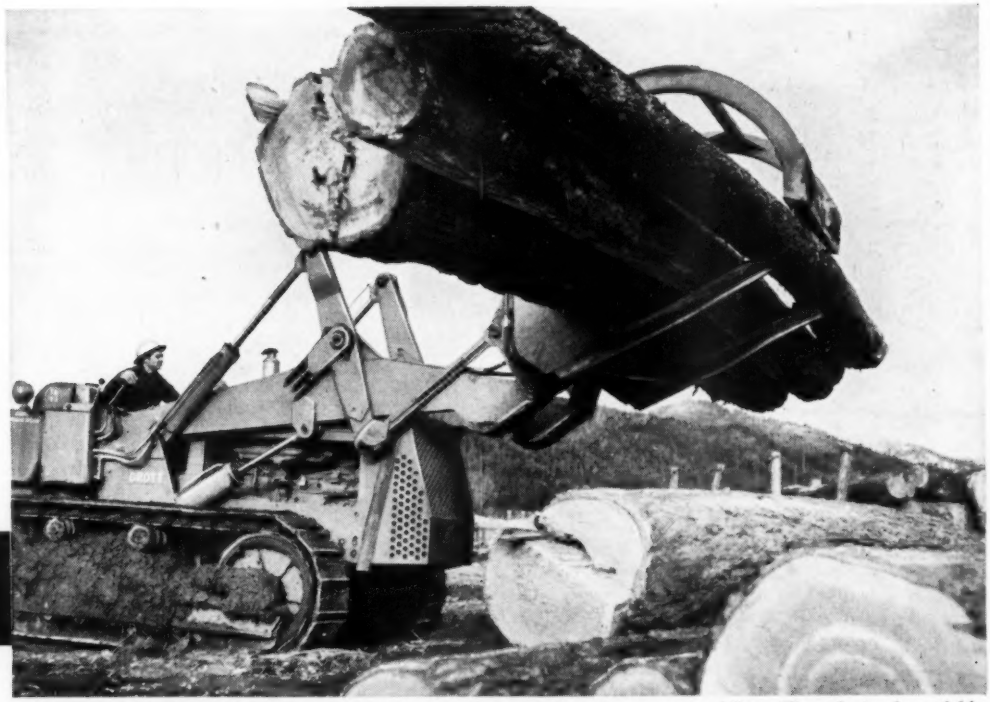
THE LOG RACK holds the top logs steady while the chain is released. The loader requires but 5 minutes to unload trucks—an operation that used to take 30 minutes with the old skid-mounted loading unit.

INTERNATIONAL HARVESTER

INTERNATIONAL®
INDUSTRIAL POWER
MAKES EVERY LOAD A PAYLOAD

MORE THAN 8,000 LOG FEET are loaded on car in 30 minutes. Single loads up to 2,100 bd. ft. are handled by the INTERNATIONAL TD-18A crawler with Log Rack owned by Rossignol Logging Co.

Don't be careless!
Save our forests!



STOCKPILE OF LOGS is built up by unloading trucks when no railroad cars are on siding. Then the loader quickly selects long or short logs from the pile to build up solidly stacked load on the flat car when it arrives.

BLACK WILLOW

Salix nigra Marshall

Its quick growth and slender, graceful, drooping branches make the black willow a good ornamental

The tree's dark brown to nearly black bark is divided by deep fissures into thick, connected ridges

THE willows are probably the most widely distributed woody plants in the northern hemisphere. While they are found to a limited extent south of the Equator, they occur abundantly in the far north, even beyond the Arctic circle to the northern limits of tree growth where they take on a stunted form. There are more than 200 species of willow of which about one-half grow in the United States and Canada. Of the 30 or more willow species native to the United States that can be classed as trees only the black willow grows to a size suitable for the manufacture of lumber in commercial quantities. Preferring the low, moist banks of streams and lakes, it is found in every state east of the Rocky Mountains. It attains its best growth in the fertile bottom lands of the lower Mississippi Valley where it reaches diameters of three to four feet and a height of more than 100 feet in close stands with a clear length of 20 to 40 feet or more. Willows are usually no taller than 30 to 40 feet with diameters not over 18 inches. Frequently there are several crooked or inclined trunks growing from a common base. When grown in the open it is a short, much branched and crooked tree with a broad, irregular crown. The slender, brittle twigs are bright reddish-brown to pale orange color. Terminal buds are absent and the reddish brown lateral buds, about one-eighth of an inch long, are narrow, pointed, expressed against the twig and covered by a single cap-like scale.

The alternate thin, narrow, short-stemmed leaves, three to six inches long and three-eighths to three-quarters of an inch wide, taper gradually to a point and are often curved like the blades of a scythe. They are light green, shining above and smooth below except for fine hairs along the veins and the edges are finely toothed. They turn light yellow before falling in the autumn.

The flowers appear in April or May with the unfolding leaves in small, erect and spreading catkins, borne at the ends of short leafy twigs, the male and female on separate trees. By midsummer each fertilized female flower has developed into a short-stalked, smooth, light reddish brown capsule about one-fourth of an inch long. It is egg-shaped, tapering gradually above the middle, and contains many minute seeds which are clothed with long, silky hairs. This enables them to be carried long distances by the wind, and large areas can thus be reforested in a comparatively short time. The seeds of black willow are said to germinate more quickly than those of any other species, seedlings having been known to come up in 36 hours. The seeds must, however, find lodgment in moist soil as they lose their vitality in a short time. Starting early in life, the trees produce seed abundantly nearly every year. The tree also reproduces itself by sprouting from the stump. A cutting or shoot stuck in the

By DR. WARREN D. BRUSH

moist ground will grow, and a freshly-cut fence post will form sprouts and grow under favorable conditions.

The dark brown to nearly black bark is divided by deep fissures into thick, connected, often interlacing ridges, separating freely into plate-like scales and becoming shaggy on old trunks. The wood of black willow is quite uniform in texture, light in weight, exceedingly weak when used as a beam or post, moderately soft and moderately high in shock resistance. It is not durable when used under conditions favorable to decay. The average weight of a cubic foot of the air-dry wood is 26 pounds. The heartwood is light brown to pale reddish brown or brown, frequently with darker streaks along the grain, and the sapwood is whitish to creamy yellow. The chief uses are shipping boxes, fruit packages, furniture and kitchen cabinets. Special uses are artificial limbs and polo balls because of its light weight, uniform texture and ability to withstand blows without splintering. Willow plantations are widely used to protect the banks of streams from erosion and as a binder for shifting sand. River banks are frequently protected by "mattresses" made from small willow trees one to five inches in diameter, so bound together as to form long mats about one foot thick and often 1000 feet long by 250 feet wide. These mats are sunk into the mud and sand at the shore line by weighting them with rocks. The flowers produced by willow trees have long been recognized as a useful source of honey, and many bee keepers have planted willows for this purpose.

Probably about 90 percent of the black willow of a sufficient size to be sawed into lumber is in the Mississippi Delta region. Mississippi and Louisiana are the principal willow lumber producing states.

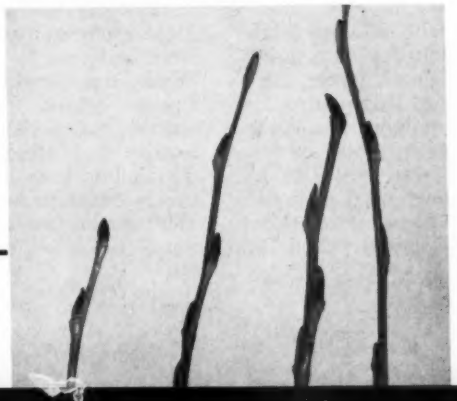
The tree grows very rapidly, especially when young. In the Mississippi Valley, trees 40 years of age are about 100 feet high and 20 inches in diameter. The greatest age recorded for black willow is 85 years. As the wood is very susceptible to attack by fungi, mature trees often have decayed and hollow centers; they are also often seriously injured by the wind because of the brittleness of the green wood. Although subject to damage by fire they are largely protected by the wet sites in which they grow. Black willow is often planted for shade and ornament. Although short-lived and liable to injury by storms, the tree is well-liked for its quick growth and slender, graceful, drooping branches.

The leaves are alternate thin, narrow, short-stemmed and are from three to six inches long

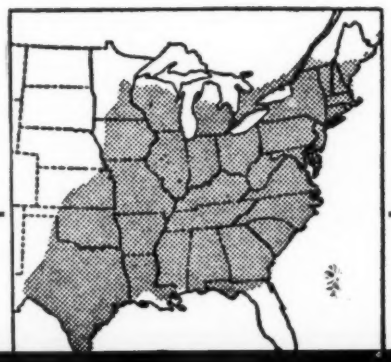
Fruit of tree is egg-shaped, tapering gradually above the middle, and contains many minute seeds

The flowers appear in April or May with the unfolding leaves in small, erect, spreading catkins

The slender, brittle twigs are bright reddish-brown to pale orange in color



Range map



By ALLEN RIVKIN

Loggers and Logging in the 1860's

IN THE Civil War era weather conditions always controlled the logging operation. Lumber was cut and hauled out of the woods in winter and floated to the mill ponds after snow melt.

The expedition usually started about a week before the first predictable snowfall. Men, oxen and supplies were assembled at strategic places. The "bullwhackers" drove the advance guard into the forest. Day after day the drivers sat on their boxes, cracking the knotted leather whips over the heads of the oxen, bracing their bodies against sudden plunges into mud holes in the trackless wilderness, and disregarding temperatures that made men's noses run and froze their ears. At nightfall the cavalcade stopped. The men slept on hay underneath the wagons.

The first task upon reaching the projected seat of operations was to clear the campsite, usually buried in huge snowdrifts. First the cook or "crumb boss" unpacked his supplies and set up an open air canteen. Then the snow was cleared, a cook and bunk shanty erected, and a four-foot bean hole dug in the ground. Since baked beans were the staple of the diet for the entire winter, the fire in the bean hole was never allowed to die, from the time ground was broken in the fall until the camp was abandoned in the spring.

The cook and bunk house was a long, one-room log cabin, with small windows and low doors, the cracks were chinked with moss or pulverized bark to shut out the icy winds, the windows were made air tight, and the floors were either earthen or planked with wood. In this huge room as many as a hundred men ate and slept; the huge pot-bellied stove or fireplace was always burning; and the air reeked with the mingled odors of unwashed bodies, steaming wool socks, scorching moccasins, and other sweaty habiliments, not to mention the stinking spittoons.

As soon as the camp was erected, logging operations began. The advance scout or cruiser, then as now, marked out the cutting area the spring before, mapped the streams and roads (if any) and suggested the trails which had to be built.

The leader of the expedition——called the "Bull of the Woods"—followed the cruiser's routes. With the latter's crude maps and directions, he led the attack on the forest in such a way as to insure the most remunerative but steady retreat of the timber. Clear cutting was the only method used in those days on large scale operations—in the Lake States as well as in New York or Pennsylvania, or the forests of New England.

Before the actual cutting could begin, however, a crew of swampers had to clear the underbrush. Ripping up the small, scraggly bushes and young trees, the vines and other impedimenta, they cut a path wide enough for two huge sleds pulled by eight oxen to pass. The swampers were followed by the undercutters. Theirs was the ticklish job of deciding in which direction the tree should fall. Standing on springboards, they attacked the tree with double-bit axes about 24 to 30 inches from the base. After 20 minutes of this ax-swinging their job was finished and a deep wedge had been driven into the stem.

Next came the cutters or fallers with their long, two-handled saws and bottle of saw oil. Silently they inspected the notch made by the undercutters and mentally drew a line along the circumference of the trunk. Facing each other, they planked their calked boots firmly in the snow or ice and grabbed the shiny crosscut saw. When they had cut into the center of the trunk, a steel wedge was driven behind the saw to keep the tree's weight off the cutting instrument and incline it in the direction designated by the undercutters. Soon the huge trees began to totter and the fallers' pace was stepped up because the end was near. Suddenly, a faint moan was heard within the trunk and the cry of "Timmm-berrrr!" resounded through the forest. Everybody within hearing distance ran for safety lest the "widow-maker" actually do what its nickname implied. The topmost

The lumberjack of nearly a century ago lived a lonely life while in the woods, but come April and a trip into town he invariably made up for *all* lost time

branches were already swaying as the fallers jumped clear. A high-pitched, wounded cry came from the tree as it crashed against the frozen ground.

The fallen tree now came under the scrutiny of the "sawyer" or "bucker." A six-foot saw slung over his strong shoulders, he tramped through the snow behind the fallers. His was the solo act in a huge co-operative performance. Measuring off fifty feet, he began to cut through the bruised bark. In the 1860's fifty-foot lengths were regarded as the easiest to haul out of the woods and float in the streams. Later, when marketing associations began to standardize the size of boards, thirty-two foot lengths were cut. Not that fifty or thirty-two feet sawlogs were always insisted upon. If the bucker thought that 40 or 20 foot logs could be toted out of the forest more easily, his judgment prevailed.

The next step in the logging operation was the "drag" or "haul." Nowadays, timber is generally hauled out of the forest by some kind of automotive power. Ninety years ago, logs were dragged to yarding sites by the brawn of many animals driven on by a bull-whacker's lashing tongue and his persistent whip.

Harness for the oxen was made from birch or similar wood hewed and shaven to form a yoke bow. A bobsled was built of four heavy logs laid crosswise, their undersides shaved smooth. On the rear bar a "bunk" was constructed to strengthen the sled and provide a base for the tow. Next a round log was cut to form a "tongue." A piece of iron, the clevis pin, was pounded through the tongue and front bar. The yokes of the oxen were tied to the tongue, and their backstraps hooked to the bobsled.

Then a skidroad was devised with two large trees. The logs were either bull-dogged up the skids and into the sleds with peavies and canthooks, or with carefully directed oxen.

The haul to the yarding site, usually the bank of a stream, or to the cold deck, was a battle of men against death, particularly in rolling country, or areas filled with shaky bogs or icy hollows. Instead of logging roads there were merely trails through the stumpage. If the ground was somewhat soft the jacks would freeze the snow with water taken from the unfrozen streams. Icy roads, although they enhanced the danger of the operation, facilitated the hauling of lumber.

Teams of eight plodding oxen, double-hitched, dragged the cargoes out of the woods. Downhill the haul was usually murderous, since fifty-foot logs flying through space can be as deadly as sixteen-inch shells. Customarily a snub line was employed, usually a hawser three inches thick and about twice as long as the pitch

on which it was used. The snow was shoveled off the line until the earth was visible. If, as was usually the case, the earth was frozen, boughs, twigs, manure and garbage were tossed on the ice to slacken the velocity of the moving load.

At the summit of every hill or knoll a tree was felled to provide a stump about four feet in circumference. The teamster would halt his puffing oxen at every summit, jump off the box and start his snubbing machinations. First he would pass the rope around the logs, making two half hitches, so that when the strain fell on the line the noose would be drawn tight. Then he would tie the line around the stump three or four times, shoving the coil down as close to the ground as possible. The remaining length of rope extended downhill.

Before beginning the descent the teamster would speak to his frightened animals reassuringly. Watching the slack with apprehension, he would wait until the rope was taut, then jump on the sled. The hawser grunted along the shaven stump, the friction created by the folds of the rope on the stump holding the load off the oxen, while the weight of the line prevented it from unwinding rapidly. But terrible and unexpected things could and did happen. The threads of the tough hemp might snap. . . . The teamster didn't have to hear the whinnying sounds to know that the strands were separating; a convulsive flip of the line apprized him of the danger. Snapping his bull whip over the oxen's heads, he warned them in uncouth language to speed up their pace.

But they didn't need the warning. With frantic violence they charged downhill, neck and shoulder muscles taut, their short legs pounding the frozen ground, sides heaving with excitement and saliva oozing from their puffing mouths. The monstrous load of logs careened back and forth over the icy course, sometimes coming to a halt safely downhill. Often, however, the logs left the road and crashed against the bordering trees, endangering all living things in their path. Sometimes one of the animals would lose his footing and drag his companions to death. Death frequently rode with the snub line.

This method of snub-lining was dangerous enough, but the operation often used on steep grades or lengthy pitches was far more hazardous. The big line was tied around the load, coiled two or three times over the shiny stump, and deposited a few feet away. As the load descended, two ground men, wearing thick leather mittens, slowly released the hawser. Their chief concern was to keep the taut line winding around the stump as smoothly as possible. If the rope moved too rapidly, an iron or wood lever was pushed against the hemp, binding it more closely to the stump. This increased the friction and tended to check the load.

Sometimes, however, the ground men noticed the slack growing; instead of paying out smoothly, it might jerk and jump; and unless the erratic motion could be stopped with the friction-lever, there'd be hell to pay. The snub line might snap, or its gyrations would become so violent that the men would be forced to drop it. A shrill cry of oncoming destruction would then pierce the air and the bullwhacker and his team would rush for safety.

What of hills too steep for man or beast to navigate? Today chutes are built to carry the logs swiftly to the landing places. In the 'sixties, no such precaution was taken. The teamster drove his cargo to the summit, unhooked the binding chain, and with his canthook pushed one giant log after another over the cliff.

It has often been said that the rivers of the country are the blood which feed the heart of the lumber business. In the early 19th century the frontiersman set up his mill in the forest, and used the streams to bring his boards to market. When the timber was exhausted on a given tract, he dismantled the mill and set it up again further upstream.

Large-scale lumbering, such as Weyerhaeuser and his associates introduced in the Civil War era in the Lake States, demanded a more efficient method—the logs were floated to the mill on rafts. They were laid twenty-four to thirty courses deep, at right angles to each other, forming a tightly-knit structure which could withstand heavy tides and swirling rapids. The ordinary raft was 148 feet wide and 160 feet long, carrying approximately 180,000 board feet of lumber. Built in shallow water or on the shore, it was floated either by the spring freshets or on rollers. After a crude shanty had been erected in the center, the crew of 12 to 18 men would push their craft into the river with oars or poles. In good water, they might navigate 40 to 50 miles a day, tying up at night to a bank.

Pioneer lumbermen claimed that rafted timber was superior to lumber conveyed overland for the water-soaking tended to remove much of the sap. True it was, but a great deal of mud, dirt and grit was also picked up en route.

The drivers of the rafts were called "white-water men." In the early days they were usually recruited from the ranks of the lumberjacks. Later, they became specialists who contracted to move a specified number of rafts from one location to another. The trend in lumbering was always toward specialization.

The handy-man who rode the circular stumps on the white waters was the glamour-boy of his day. Shirt-sleeves rolled up, wearing spiked leather boots to give him traction on the slippery craft, cant-dog firmly in hand, he was a powerful, arresting figure on the rivers of the Lake States.

Logs could be moved only in a "driving pitch," when water ran high, in April, May, and early June. If the destination wasn't reached before the river began to run dry, the drive might be stalled until fall or, perhaps, next spring. No river hog wanted it said of him that he left his cargo to rot in the hot meadows or dry river beds. The drive was, consequently, often a race against time—the logs had to be ferried to the mill ponds or rafting depots before the water ran low and the green rocks in the river beds became visible.

In narrow streams, drivers lined the banks and poled the "sticks" away from rocky ledges which might arrest their movements. For what the river hog dreaded most was a jam. During such a crisis, the driver's utmost skill was called into play; with cat-like movements he guided the floating mass towards its destination. If the pike pole couldn't jar a recalcitrant butt-log off an obstacle, he would jump into the chilling water and release the prisoner. If the water were too deep, he rode a "batteau," a little Indian canoe made of bark or scooped out of wood. At every bend of the stream drivers would stand on the shore and "tend out" — push the logs off the bank, keep them moving downstream.

At the head of the drive the "white-water men" had the toughest jobs, for here, as at the river bends, unusual skill was needed. In a swift tide a few unregimented logs might get tangled up, creating an exasperating bottleneck. Men up-

(*Turn to page* 46)

How foresters can take full advantage of Allis-Chalmers Dealer Service Plan to help protect profits

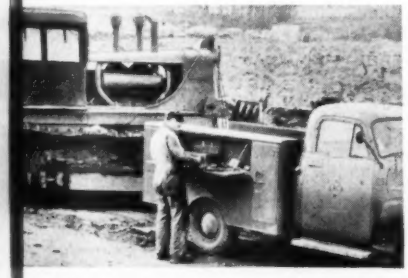
BENEFITS: Better performance • More time on the job • Longer equipment life • Lower maintenance cost • Higher resale value

Experience has convinced many foresters that the Allis-Chalmers Dealer Service Plan is geared to keeping equipment operating efficiently. They have found that taking full advantage of such service is easy, and that it pays big dividends. Here's why.

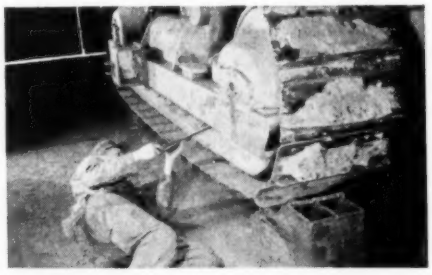
Allis-Chalmers dealers offer them a *planned* approach to service, right from the day their equipment is delivered. It covers everything from service schools to lubrication schedules, and from parts to preventive maintenance.

You owe it to yourself to take a look at the advantages this service plan offers. Then see your nearby Allis-Chalmers dealer soon and ask him to give you all the facts.

PREVENTIVE MAINTENANCE TRAINING KITS — movies, slides, charts and literature — are available for helping you train your own personnel. Your Allis-Chalmers dealer will present it for you at your convenience or arrange to have a factory man do the job.



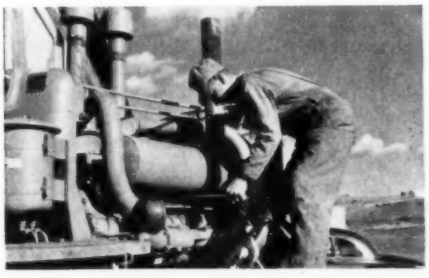
FAST PARTS SERVICE. Factory-built Allis-Chalmers parts are stocked in quantities by the *dealer,* to give you parts service close to your job. Experienced equipment men agree it pays to use only standard factory-built parts.



SCHEDULED CHECKUP PROGRAM — Your Allis-Chalmers dealer will help you plan a schedule for all maintenance work. You'll save excessive repair bills, avoid costly downtime and get far better performance, longer life from your machines.

OPERATING TIPS — Allis-Chalmers dealer servicemen are trained to give your operators all the facts they need to operate equipment most productively — for example, how to recognize when adjustments should be made.

SPECIALIZED FACILITIES at your Allis-Chalmers dealer include factory-approved tools and all necessary service equipment. Factory-approved methods are used to save you time and money, assure finest workmanship.



FACTORY-TRAINED DEALER SERVICEMEN have the specialized experience to help you spot trouble symptoms fast, help you prevent costly breakdowns. Their training never stops; they make it a *policy* to stay abreast of every development.

FACTORY SERVICE SCHOOL TRAINING is open to your operators and servicemen just as it is for Allis-Chalmers dealers. Your men discover that Allis-Chalmers design simplicity makes the equipment easy to learn . . . easiest of all to service.

ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

The Reasons for Research

(*From page* 13)

reasonable uniformity as to topography, soils, forest types, and economic conditions. In conformance with the natural problem areas, these research center territories can and usually do cut across state lines.

Each center has a staff of research men. It also has one or more experimental forests or ranges (averaging around 2000 to 10,000 acres in extent usually located on a national forest or on areas under long time lease, where problems can be studied and results tested on a pilot-plant basis.

Research in forest management and silviculture concerns the establishment, culture, and harvesting of the tree crop. In the early decades of this century, research in this field was largely taken up with the harvesting of forests as they occurred in nature. We are now in the process of conversion from original and second-growth forests to man-cultured forests. Also, millions of acres of once-cultivated lands are now reverting to forests. This conversion has been accelerated by the introduction of land treatments with fire, chemicals, and large machines designed to destroy brush fields, to drain wetlands, to seed or plant new trees, and otherwise speed up better land use. The speed and soundness of this rehabilitation process will depend largely on the findings of researchers in the fields of forest soils, forest ecology, plant physiology, genetics, silviculture, and the financial aspects of raising tree crops. Research is being pressed to produce superior strains of forest trees for forest planting, and to provide the information needed for the scientific culture of secondary forest types and less productive lands by-passed in the earlier stages of forest research.

One of the most-needed, but thus far most-neglected fields of forest research, is in genetics or tree breeding. With a huge forest planting program ahead of us (it is estimated that there are 65 million acres in this country where artificial regeneration can be justified economically) and with a very sizable planting program already under way (area planted by all agencies in 1953 estimated to be one-half million acres, using one-half billion trees), there is urgent need to grow the best possible planting stock to assure maximum future production of the highest quality material for the particular purposes grown. Little is known about the hereditary traits of the hundreds of millions of seedlings being planted each year; we do know that a large percentage comes from inferior parents. Here lies a vast field of unexplored research in breeding superior trees that has scarcely been scratched. Just enough has been done to indicate the great possibilities lying ahead. Even Sweden is spending as much on this type of work annually as is the United States.

Studies of the problems of fire control afford opportunities to reduce fire losses and to improve the efficiency of a job now costing about 70 million dollars annually. The fire problem is also accentuated by the responsibility all fire protection agencies will face in case of a new outbreak of war, since any air war is likely to be a fire war through both incendiary and A-bomb attacks. Present annual expenditures for fire research by all agencies total about $625,000, representing less than one percent of all fire protection funds. This is far below what is needed to develop new and better ways to check fire losses and get more for our fire-fighting dollar.

Watershed management research concerns plants, soil, and water under various environmental conditions as they affect water supplies, floods, and sedimentation. Much has been learned about the basic principles governing watershed behavior and the effects of various forest and range practices; but much is still unknown, particularly as to the best methods for correlating the production of timber and forage with the need for conserving water, improving water quality, and reducing flood damage.

Sound forestry necessitates appraisal of financial and social factors as they influence the production and use of forest resources; forest economics research does this, with one of its major tasks the conduct of the national forest resource survey. This survey, which gives us a current picture of the forest situation nationally, began in 1930. Since then the initial survey has been completed on about 70 percent of the continental United States, and the remaining unsurveyed area is located mostly in the Rocky Mountain area of the West, including sizable acreages of noncommercial forest land. In addition, a survey is only now getting under way in Alaska. Resurveys of the important areas originally covered during the 1930's (mostly in the Pacific Northwest, Lake States, and the South) have been made on approximately 50 percent of those areas.

In view of the rapidly changing forestry situation, due in part to rapid expansion of forest products industries and declines in merchantable timber resources, it is important to keep the forest survey up to date. To do this adequately will mean stepping up survey appropriations to the schedules already authorized by the Congress. States and industries are presently contributing a good share of survey costs, to obtain additional detailed information on a local basis. Demands for information on forest resources are increasing, which reflects the fact that many of the policies confronting public agencies and forest industries can best be worked out by using the accurate and up-to-date forestry information provided by the Forest Survey.

Products research aims to make forest products give better service and greater satisfaction to the user at lower costs, to develop new products, and to utilize what otherwise would be wasted. Great improvements have been made in recent years in the diversification of products and in the expansion of new industries using wood as a raw material. By further improving utilization facilities and intensifying forest management practices in the woods, we can be assured of greater yields with less unused material. To achieve this is a great challenge to research.

Research on forest insects and diseases and on forest wildlife management problems is also of importance to our forest economy. As a matter of fact, insects and diseases now surpass fire as destructive agents to the forest. It is generally recognized that research programs in the field of forest insect and disease control need to be greatly stepped up to keep pace

(*Turn to page* 42)

State Control Cited as Possible Solution To Some Refuge Problems in West

IN RESPONSE to questions concerning possible abandonment of certain wildlife refuges in the West, Fish and Wildlife Service Director John L. Farley said at a recent press conference that the solution to the problem might well be state control of those refuges the Service feels it can no longer maintain. He said, however, that the refuge situation is being studied by an advisory committee whose work has not yet been completed, and that public hearings probably will be held before any definite action is taken.

Queried by representatives of conservation organizations about other phases of wildlife refuge conditions, principally the legal status of such refuges and the pressure of some oil companies to open the refuges for exploration, Director Farley said he thought the legal status of the refuges was strong enough, but if there was any question about it, the problem would certainly be taken into consideration. Concerning the possible exploration by oil companies, Director Farley said it was his judgment that on some of the larger areas oil exploration would not be detrimental to the refuges, whereas in some of the smaller ones it would. In his opinion, he said, the most feasible plan to pursue would be to designate certain areas as inviolate, while permitting exploration in others, thereby following a middle-of-the-road course that would be detrimental to as few interests as possible.

The arrest of two Maryland State conservation officials for duck baiting last month was brought to the attention of the conference by one of its members. Director Farley explained that this occurrence was the result of a policy being followed by the Service in order to gain closer cooperation of state officials in enforcing game laws. He said the Service was informed earlier that little or no enforcement existed in Maryland, and that additional help from outside of the state must be used. The enforcement group sent into Maryland was instructed to make arrests only in flagrant cases, and then only in instances of specific violation of the state code; thus giving the state courts complete jurisdiction over the cases involved and disallowing any question of the federal government usurping the state's authority in any degree.

One of the most interesting statements to be brought to the attention of the conference was that made by Dr. Oscar E. Sette, regional director of the Service's Pacific-Oceanic region. Dr. Sette described the novel procedure now being used in the Pacific to locate new areas for commercial fishing—studying the ocean current system. By using this method they have already been able to locate fertility areas of yellowfin tuna in the equatorial region — where upwellings from the ocean floor meet the drifts toward the north, and skipjack tuna which have been found to prefer the eddied waters south of the Hawaiian Islands. Explorations are now underway, made possible by the Saltonstall-Kennedy Fund, to discover fertility areas of the albacore in the rough waters of the northern Pacific. As there is very little land and a vast amount of water in the Pacific area, new fishing areas must be found to perpetuate if not improve the economy of the Pacific region, Dr. Sette said.

WITH EVERY CHAIN SAW IN THE

GREAT Mall LINE

FREE PROTECTION AGAINST

- FIRE • LIGHTNING
- WINDSTORM • CYCLONE
- TORNADO • HAIL • STRIKES
- RIOTS • CIVIL COMMOTION
- EXPLOSION • FLOOD • THEFTS
- FALLING TREES AND LIMBS
- COLLISION DURING TRANSIT

Not only does MALL give you the finest line of chain saws (you can choose the model that EXACTLY fits your needs) —but on top of that, MALL gives you this EXCLUSIVE protection for your saw. No wonder that through the years, chain saw users have learned that the MALL name means DEPENDABILITY!

0MG—What a buy! Outcuts saws costing up to $100 more. 3½ hp., 24 lbs. $194.00 with 12" bar.

1MG—NEW sturdy construction. NEW dynamic power. NEW engineering firsts. 3½ hp., 29 lbs. with 18" bar. $255.00

2MG—Dynamic 5½ hp. engine plus amazingly light weight . . . terrific day long production saw with 18" bar. $295.00

3MG—Newest of the new! REAL DURABLE PRODUCTION SAW.

5½ hp., high speed, lightweight, new diaphragm carburetor, with 18" bar. $295.00

MALL TOOL COMPANY PORTABLE POWER TOOLS GASOLINE • ELECTRIC • AIR

7761 South Chicago Avenue, Chicago 19, Illinois

Send me all the facts about INSURED MALL Chain Saws.

*Name*_____

*Company*_____

*Address*_____

LU-187

The Reasons for Research

(*From page* 40)

with the seemingly ever-increasing menace from these forest pests.

Although federal efforts dominated the field for many years, forest research has also been under way at the state agricultural experiment stations and at forest schools throughout the country. Industry has also developed a number of forest research programs at some of the larger corporation plants, mostly in the field of improving forest products. Forest industries also underwrite research projects at several private laboratories, and make grants for scholarships and fellowships for graduate training and for research on forestry problems. However, much industry-supported research is of a confidential nature and not available to the public.

Forest research projects by their very nature take many years to follow through to completion. As studies progress, new aspects develop, and when some investigations are completed, others branch out along new and promising lines. Some of these result in fundamental discoveries of great public value. It is particularly important, therefore, that forest research, as with all other branches of research, be adequately financed for continuity of effort. Past research in forestry has paid rich dividends; its future holds great promise to the nation's welfare.

In 1950 the U. S. Forest Service made a compilation of expenditures for research in the United States (reported in U.S. Senate hearings on the Agricultural Appropriation Bill for 1951). It found that funds devoted to forest research by all agencies had tripled between 1940 and 1949. The total expenditures for forest research in 1949 were estimated at close to $17 million, with industry responsible for 32 percent, federal agencies 29 percent, the states 24 percent, and private institutions and colleges 15 percent.

Of the total funds currently expended on forest research in this country, the federal contribution in the field of forest management and protection (including fire, and insects and disease) amounts to about 58 percent; in the field of economics (including forest surveys), federal funds again predominate, totaling 65 percent; but in the field of products research, industrial efforts made up 75 percent of the total, not including large amounts spent for industrial development and quality control research, largely in pulp and paper manufacture.

Much of the federal forest research under way in the United States is undertaken on a cooperative basis. By cooperative research is meant research planned and organized jointly, with mutual agreement on what the program will be, how the work will be done, and how the financial load will be shared. In cooperative research some problems are attacked jointly, the cooperators merging their facilities and personnel; other problems are divided into segments for individual attack, each cooperator working on his assigned projects under correlated arrangements. In 1949 the Forest Service found that approximately half of all non-federal research was being carried on cooperatively with federal programs. This compares with only one-fourth in 1940. In 1949 the Forest Service had 644 cooperative agreements with non-federal agencies for the conduct of research, as compared with only 140 in 1940.

For many years Forest Service research programs have been guided in part by advisory committees, both on a local basis (at research centers) and, more recently, at the national level. These advisory committees are made up of technical men from other public agencies, colleges, and industries who use currently the findings of research. Their advice has been very helpful in the formulation and conduct of research programs, and in recommending priorities to the most important problems; this has made for more efficient expenditures of federal research funds.

The Society of American Foresters in 1953 began a two-year study of forestry research in North America, under a grant of $30,000 from the Rockefeller Foundation. In cooperation with the National Research Council, this study has reviewed the progress of forestry research in North America during the past quarter-century, has summarized the status of current forestry research by all agencies, and has set up goals for forestry research during the next quarter-century. The report is now in final draft and should appear in print within the next few months.

To assure the nation an abundance of forest products in the future, one of the most promising avenues lies in strong and diversified forest research. This calls for much more than is now being done by all agencies working in this field. Public agencies in particular have a major responsibility for conducting forest research. In the past, due to pressures for solutions to urgent problems, major attention of public research agencies has been given to the application of current knowledge to forestry practices. At present, it is estimated that about 88 percent of federal forest research effort goes into this field. Such applied research is important, but if maximum progress is to be made in the years ahead, there is need for more fundamental or basic research, aimed at the discovery of natural laws or principles leading to new knowledge. Some of the more obvious basic sciences related to forestry are: biology (the science of all living things, including trees and other forest plants); ecology (the relationship of living things to their environment, including soil, climate, light, other plant life, and animal life); plant and tree physiology (dealing with the vital processes that control growth and physical structure); genetics (the science of inherited characteristics); forest pathology (the science of tree diseases); and forest entomology (the science of forest insects). In all of these basic fields of research, public agencies and educational institutions should take the lead. It is expected that, for the most part, industrial organizations will concentrate their efforts on applied research and provide more of the necessary pilot-plant developments for promising fundamental research leads. However, in the general field of all forest research, close cooperation should be maintained between public institutions and private industry.

In view of the demands for new information and the shrinkage in value of the research dollar, it is estimated that current forestry research efforts by all agencies should be at least doubled during the next five to 10 years. In all these programs, the availability of c o m p e t e n t, well-trained men is a limiting factor to rapid expansion but educational institutions can be expected to take

care of this over a five to 10-year period.

We still have much to learn in forestry. These are many ways of improving present forestry practices —doing them better, faster, and at less cost. Many important fields of forestry have received entirely inadequate attention from the standpoint of research. Examples are: watershed management, fire protection, forest insects and diseases. forest genetics or tree breeding, utilization of low-quality woods, and the economic aspects of forest management.

Research cannot wait until practice catches up with knowledge—it must anticipate future needs. Backed by new knowledge, soundly applied, this nation need have no fear of a shortage of forest raw materials. The potentialities of forest research to contribute to national prosperity, security, and progress are far-reaching. Given the backing it deserves, forest research will contribute greatly to the social and economic betterment of future generations.

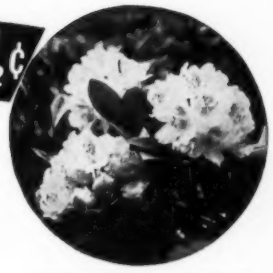
Wetlands

(*From page 27*)

additional wetlands, the National Wildlife Federation — an organization devoted to the conservation of our natural resources—has launched a campaign to save America's waterfowl marshes from drainage. It has chosen for its 1955 slogan, "Save America's Wetlands!" During National Wildlife Week, March 20 to 26, and for the rest of the year, the Federation's objectives are: 1) to disabuse the public of the common but erroneous idea that all marshlands and swamps (inland and coastal) are nuisance areas that ought to be drained, and 2) to set in motion a series of constructive actions designed to preserve and/or restore these vital areas of wildlife habitat.

When you realize that 95 percent of the American fur harvest—worth about $25,000,000 annually even at today's low fur prices—is produced on the wetlands of the nation, you can understand how valuable such areas are. And when you see, as I saw, the response of waterfowl on a restored area like Horicon, that produced in the summer of 1954 almost a duck for every one of its 20,783 acres, and whose fall concentrations of migrating geese number around 40,000, you know that our wetlands mean wildlife.

RHODODENDRONS LOW AS 37½¢



These five native American flowering evergreens are the Aristocrats of all garden plants. All are carefully dug and packed—not to be compared with ordinary collected natives. We ship tens of thousands a year to large estates and small gardens—many repeat orders. Need acid soil. humus, moisture and partial shade but no cultivation.

"LINER" SIZE — Single stem plants with some earth, about 12 inches. Express on 25, about $2.50, on arrival. (25)	(100)	These named species will give you gorgeous bloom from May to July.	LANDSCAPE SIZE — Several-stem clumps balled & burlapped, 12 to 15 inches. Express on 25 about $5.00 on arrival. (10)	(25)
$12.00	$42.00	Kalmia (Mountain Laurel) (Pink-white, June)	$12.00	$27.50
10.50	37.50	Rhododendron maximum (White, July)	12.00	27.50
16.00	58.00	catawbiense (Rose, June)	14.00	35.00
16.00	58.00	carolina (Pink, May)	14.00	35.00
12.00	42.00	Leucothoe (White, May)	12.00	27.50

5 of one kind at 10 rate, 50 at 100 rate.

SAMPLE 5—One each of kinds listed at left. 12-15 inch, B&B Landscape Size, postpaid $9.25.

LARGER 5—One each, or sorted as you wish, 1½ to 2 ft. high, B&B, boxed for express (about $5. extra on arrival). Box of 5 for $16.75.

For complete information about other evergreens send for the catalog described below.

HEMLOCKS

(Entirely Nursery Grown)

25 for $18

12 to 15 inches high, twice transplanted, bushy.

Quick-growing, handsome evergreens. Grow in sun or shade. Hemlock makes the most beautiful of all hedges. (Space 18 inches apart in row). These trees are lusty 6-year-olds, ideal size for safe shipping. Express on arrival ($1.50 to $2.00).

Larger quantities: 100 for $70. 1000 for $650.

Smaller Sizes (9 to 12 inch), same age (6 years), also twice transplanted: 25 for $12, 100 for $45.

Larger Sizes (15 to 18 inch), 25 for $35, 100 for $130.

Bargains in Sturdy Young Shade Trees

		(10)	(100)
ACER (Maple)			
Rubrum (Red Maple)	4 to 6 ft.	$15.00	$125.00
	6 to 8 ft.	22.00	180.00
saccharum (Sugar Maple)	4 to 6 ft.	15.00	135.00
	6 to 8 ft.	22.00	180.00
platanoide (Norway)	5 to 6 ft.	18.00	150.00
BETULA (Birch)			
populifolia (Gray)	4 to 5 ft.	18.00	150.00
papyrifera (paper)	4 to 5 ft.	18.00	150.00
CLADRASTUS (Yellow-wood)	4 to 6 ft.	27.50	200.00
CORNUS florida (dogwood)	4 to 5 ft.	30.00	250.00
LIQUIDAMBER (Sweet Gum)	4 to 5 ft.	15.00	125.00
LIRIODENDRON (Tulip)	4 to 5 ft.	12.50	95.00

		(10)	(100)
PLATANUS			
(Amer. Sycamore)	4 to 5 ft.	$12.50	$ 95.00
	6 to 8 ft.	22.50	175.00
POPLAR Carolina	4 to 5 ft.	10.00	85.00
Lombardy	5 to 6 ft.	6.50	55.00
Bolleana	4 to 5 ft.	12.50	100.00
SALIX (Willow)			
Babylonica (Weeping)	4 to 5 ft.	9.50	85.00
Wisconsin (Hardy Wpg.)	4 to 5 ft.	9.50	85.00
Golden Weeping (Niobe)	4 to 5 ft.	9.50	85.00
SORBUS (Mountain Ash)	4 to 5 ft.	23.00	200.00
TILIA (American Linden)	4 to 5 ft.	15.00	120.00
ULMUS (American Elm)	5 to 6 ft.	18.00	145.00
pumila (Siberian)	5 to 6 ft.	18.00	145.00

5 of one kind at 10 rate, 50 at 100 rate.

This DIFFERENT Catalog FREE

with each order or sent for 10c to cover mailing costs. Careful descriptions of 122 different trees, 50 vines, 152 shrubs, 140 broadleaf evergreens, 66 azaleas, 90 conifer evergreens, 121 fruits, 250 hardy perennials. Many photographs, climate chart to show where plants are hardy, helpful graphs and soil information. A compact book of 64 pages, full of FACTS. Limited edition, so get your FREE copy with order NOW, or send your 10c.

KELSEY NURSERY SERVICE

Address Correspondence to Dept. D-2, Highlands, N. J.

Cutting the Redwoods Selectively

(*From page* 12)

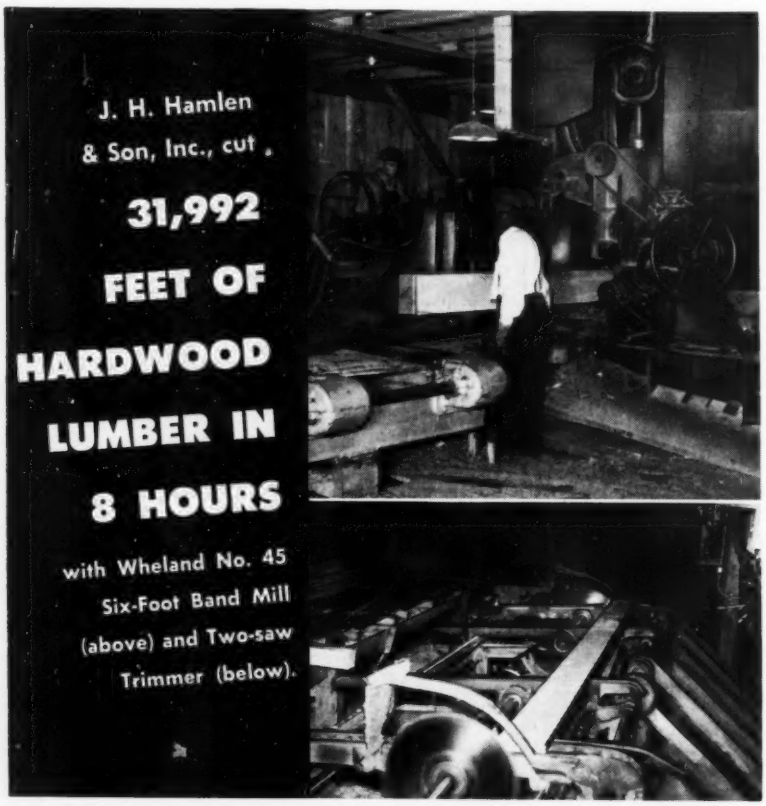
Region Logging Conference, the tree farm program and the intelligent administration of the California Forest Practices Act by the State Forester under the State Board of Forestry. (A long-time past president of your Association, Mr. William S. Rosecrans, has been Chairman of the Board since 1943). The RRCC, RRLC and the tree farm program were inspired by and are supported by industry and, in the case of the RRCC, also by local people, and the RRLC by equipment distributors. The RRCC has had unusual success in taking to the public the actual story of tree growing, fire protection, the significance of perpetual operation, and the like. The public response has been very comforting. It must be remembered that a large part of the public in a lumbering community is employed in lumbering. The support of this sector is imperative for the success of a forestry program.

The RRCC undertook to have vocational forestry and lumbering courses added to local high school curricula. Six redwood region high schools now offer such courses and have employed trained forestry teachers. Others will soon be added. Humboldt State College, in the heart of the region, has two forestry professors and offers more advanced courses.

The most recent catalyst in the promotion of an understanding of the practice of forestry is Humboldt County itself, operating entirely independently. This county is the third largest producer of lumber in the entire U. S. It is so heavily dependent on the forest industries that its prospects for future prosperity, if not survival, were examined by the local Farm Advisor, W. D. Pine, and later by a 17-man forestry committee, which got the University of California to assign Prof. Henry Vaux to make an economic study. The first result of the committee's work was the appointment on July 1, 1953 of a trained man to serve as County Forester. The Vaux report was later presented and is certain to be the basis of inspired interest and action on the part of the county officials.

As stated at the outset, the redwood industry was one of the first in the U. S. to look into forestry. There were the handicaps mentioned. These hurdles have been pretty well crossed. There is a realization that redwood forestry is not as easy as it was once thought to be, but that it is feasible and that permanent production waits only on the solution of planting problems. Steep terrain, heavy logs, a tremendously important slash disposal problem, and a four to five-month long dry period are technical problems the loggers and the foresters still have to make their jobs exciting and intriguing.

There is much yet to be done. Redwood forestry is still far from perfection. But, the progress, once started, has in only 20 years made consistent and substantial headway.



Here's the report from A. L. Miller, Manager of Lumber Division, J. H. Hamlen & Son, Inc., Little Rock, Arkansas.

"We have cut as much as 31,992 feet of lumber in eight hours and can assure you that we are cutting for grade, making perfect lumber, and getting a good over run in lumber above log scale . . . The mill has not lost any time on account of the Wheland Band Mill or Trimmer since the machines were installed."

WRITE FOR DETAILED BULLETINS

WHELAND

THE WHELAND COMPANY

CHATTANOOGA, TENNESSEE — PHONE 5-3181

MANUFACTURERS OF COMPLETE SAWMILLS AND AUXILIARY MACHINERY

Special March Issue of American Forests to Honor USFS

ESTABLISHMENT of the U. S. Forest Service 50 years ago was largely due to the demands of the American people as expressed through The American Forestry Association. Ever since that time the progress of the AFA and that of the Forest Service has been closely related as the growth of forestry spread outward and downward into the states and finally onto private forest holdings.

With the year 1955 marking the Golden Anniversary of the Service, the AFA, now 80 years old itself, considers it fitting that special attention be drawn to this milestone in forestry accomplishment. A Golden Anniversary Dinner sponsored jointly by the AFA and the Society of American Foresters, February 4, in Washington, D. C., marked the first step in celebrating 50 years of good accomplishment. The second step will be the publication in March of a special issue of AMERICAN FORESTS magazine which will be devoted entirely to the progress of the Service during its first half century.

This special issue will feature a four-color cover of a typical forest ranger that catches the spirit of service that has always characterized the objectives of the Forest Service. Inside, the book will be divided up into four main sections. They are: the first 25 years of the Service; the second 25 years of the Service; the Forest Service today; and a fourth section on the policies and aims of the Service as it heads into its second half-century of service.

In addition, the book will include presentations and special art on recreation in the national forests; the evolution of forest equipment as used on the forests since 1905; the growth of conservation-type organizations and their influence; a gallery of the former Forest Service chiefs; an article on how the wife of a Forest Service ranger looks at the Service from the distaff side; a news report by regional foresters from the 10 regions of the Forest Service; and other items on historical and human interest subjects. A final feature will be coverage of the Anniversary Dinner that will be attended by conservationists and representatives of the general public from all over the United States.

While this special issue will be dedicated to the Forest Service and its 50 years of service it will also stress the major contribution made by state and private forestry in this same period. As the Forest Service points out in a recent Fact Sheet, "Progress in forestry in the United States during the half century has been great. Working together, private and public agencies have effectively demonstrated the values of organized protection against fire, insects and disease, and of good management and wise use of the nation's forest resources. . ."

R/S
Minipak
"remote area" communication
The new MINIPAK FM unit is the answer when you need dependable communication, yet can't be burdened down with excess weight. Weighs only 8 pounds, yet batteries will last a full day or better, depending upon service. MINIPAK will outdistance many of the larger, bulkier, more costly FM units. Frequency bands: 30 to 40 mcs., 40 to 50 mcs., 150 to 162 mcs., and 162 to 174 mcs.
Featherweight
Complete MINIPAK consists of
FM Receiver and FM Transmitter (2nd transmitter channel optional) Handset, Antenna, Battery Pack, and Carrying Strap.
PACKMASTER
PRICED FROM $280.00
30-day delivery.
Simple to license with F.C.C. Details upon request.
RADIO SPECIALTY MFG. CO.
2023 S.E. Sixth Ave., Portland 14, Oregon

K+E

FROM EVERY ANGLE

Traditional K&E care and precision go into the making of these useful forestry instruments . . . K&E Right Angle Instruments and The K&E Hand Level with a right angle feature.

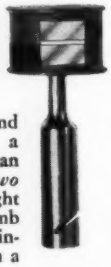
These instruments are *rugged* . . . designed to stand up without the need of constant adjusting even under the rough usage of forest work.

THE RIGHT ANGLE PRISM

This compact instrument consists of a single ground triangular prism and it, therefore, cannot get out of adjustment. A plumb bob can be attached to the hook of the handle.

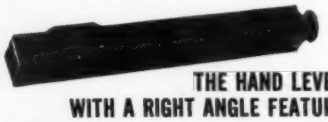
THE RIGHT ANGLE MIRROR

This instrument gives a slightly larger field of view and is adjustable. As an added feature, a small plumb bob is conveniently stowed in the handle.



THE DOUBLE RIGHT ANGLE PRISM

Consisting of two ground pentaprisms separated by a plano-parallel element, it can be *placed on a line between two points* and a third point at right angles can be sighted. A plumb bob can be attached or the instrument can be mounted on a staff.



THE HAND LEVEL WITH A RIGHT ANGLE FEATURE

Here is a dual-purpose instrument with all of K&E's famed precision. While its principal use is as a hand level, it offers the right angle feature as well. Note the flat base permitting use on a level board.

Ask any K&E Distributor or Branch for further information or write Keuffel & Esser Co., Hoboken, N. J.

KEUFFEL & ESSER CO.
EST. 1867
Drafting, Reproduction, Surveying Equipment and Materials, Slide Rules, Measuring Tapes.
New York • Hoboken, N. J.
Detroit • Chicago • St. Louis
San Francisco • Los Angeles • Montreal

Loggers and Logging in the 1860's

(*From page* 38)

stream would learn the news quickly, for traffic began to slow down. The river boss would then drive along the shore in a sulky drawn by sweating black mares, crying, "Jam! Jam! Jam ahead!"

A jam could be untangled only if the king log which originally caused the bottleneck were discovered and yanked out. Only then would the caravan move and the weird groaning and grumbling of the sticks cease. But if the king pin couldn't be found, the river might be choked with logs for many miles—jams of 10 to 25 miles were not infrequent.

A log jam was a fearful and wonderful sight. The drivers would scoot in and out, under and above the rafts, hunting the lone mischief maker. When at last it was found, the driver, grunting and perspiring, gave a tremendous push — and the prisoner was released. Then, as if by divine command, a profound silence momentarily fell upon the scene. Soon a rustle could be heard among the logs, growing louder and louder until a deafening sound filled the air. . . . Everything seemed to move—the logs, the shore, the trees, and even the green hills. The timber tumbled, cascaded, and romped downstream, heading for the mill ponds. . . .

The life of the 19th century lumberjack was extremely dreary and monotonous compared to his compeer today. A virtual prisoner in the woods from September until April, he rarely received mail or newspapers, subsisted entirely on canned or preserved food, awake before dawn and went to bed after nightfall, rarely after 9 p.m. Until the turn of the 20th century, he did not sleep on bedsheets or pillow cases, eat off oil cloth, or use napkins other than his sleeve. Recreation was of the boisterous, crude brand which vigorous men improvise.

The work day started before the sun loomed over the horizon. As 3:30 came around, the king bee, already at work for two hours, would glance at his bulbous watch, grab an iron rod and pound it impatiently on a triangular piece of steel. "Roooolllowwwwtttt!" echoed through the frosty air. Today, in the average lumber camp, the men roll out of army cots supplied with mattresses, blankets and sheets; in the old days, they scrambled out of a huge bunk bedded with louse-ridden straw and open at one end only. (Sixteen men slept in one bunk.) Today, the men move through a well-lit and ventilated bunk house to a long line of shiny porcelain lavatories, fitted with hot-and-cold showers; in the Civil War era century, they stumbled over the dirt floor toward two leaky water-filled hogsheads standing on either side of the door. Breaking the ice on the surface of the barrels, they threw some gelid water over their hands and faces, rubbed themselves with stinking yellow soap, and wiped it off on a dirty roller towel nailed to the wall.

Today, the jacks are served by a girl "cookee" and the breakfast table is set with untarnished silver, water glasses, crocks of milk and cream, sugar bowls, corn syrup, baking powder biscuits and the like. In Civil War days, the cook yelled, "Come and get it!" The men grabbed their tin plates and iron forks and went up to the mess line. Pancakes appeared every morning for seven or eight months, even though one's gullet yearned for the taste of an egg; fish was served only at supper because it took too long to eat; and the cooking was done in huge lard cans so that everything, even "shoepack" pie crust, tasted of pig fat.

Today, if the jack doesn't like his grub, he files a complaint with the union local and if the situation isn't remedied, he quits. In Civil War days the logger had to eat whatever food the crumb boss served; if he were dissatisfied he could start to walk home, usually a hundred mile jaunt through the icy wilderness to the nearest center of civilization. A man would think twice consequently before deserting the camp. Yet many a lad undoubtedly took that hike.

Towards the end of the nineteenth century the king bee's larder was considerably improved. In 1893, for instance, the foodstuffs which the commissary of a Weyerhaeuser company in the Lake States took on its initial foray into the woods consisted of 57 quarters of beef, 12 barrels of pork, 10 barrels of sugar, 21 bushels of beans, 47 barrels of flour, 2 barrels of salt, 1 barrel of vinegar, 1000 pounds of butter, 10 pounds of

saleratus, 2 pounds of sage, 100 gallons of molasses, 15 pounds of pepper, one barrel of lobsters, and a chest of tea. Food cost the company 19c per man per day in contrast to the 43c required to keep an animal per day!

The men lived in complete isolation from even the amenities of town life. Not until the railroads came into the woods were they able to enjoy female company occasionally as relief from the tedium of existence.

When April rolled around, camp was broken up. The men returned to the nearest town for a giddy debauch before they drifted homeward to their families. After six ascetic months, the giants of the forest had their fun—gaudy, raucous, hell-raising fun. The great lumbering towns of the Lake States long remembered the springs and early summers which followed the lumber drives.

Working from September through June, the average lumber jack earned about $400, minus expenditures for clothing and tobacco. After a week or two of carousing, he usually wound up bleary-eyed, whiskey-soaked, broke!

Watershed Movement

(*From page* 30)

that foresters had any large share in their selection. At the same time, even this list of watersheds covers 427 million acres — a sizable fraction of the United States.

2) As to the small watersheds selected by the Department of Agriculture as demonstration areas, it is my impression that the majority demonstrate agricultural problems rather than those of forest land.

3) Furthermore, improvement programs now contemplated on both the demonstration watersheds and those being organized under the Small Watershed Act are likely to be focused more upon upstream engineering works than upon land improvement, even on agricultural land. This point is highlighted by the following quotations from a newspaper item on the Little Hoosic Watershed Project in eastern New York State:

A long campaign by these local groups culminated last November in the Soil Conservation Service designating the Little Hoosic as a watershed eligible for federal assistance, up to $225,000 over the next five years.

(*Turn to page* 50)

Tree Trimming Days Are Here!-
Use BARTLETT
for ease of operation and protection to the operator

This Tree Trimmer has the Compound Lever side cutting head and also double leverage due to the pulley which is attached to the curved lever. It will sever any branch up to 1¼" in diameter with the slightest effort.
Only a side cutting head leaves clean wounds.
For larger limbs we recommend our No. 44 Pole Pruning Saw with 16" blade.
For your convenience we will furnish both the No. 1WE Pruner head section and the No. 44WE Pole Saw head section 30" long and 2 extra handle sections 6 ft. long fitted with quick changing sleeve connectors, known as our WE Combination Pruner and Saw.

Two complete tools . . . longest section 72 in. . . . EASILY CARRIED IN SMALL CAR.

Length	Weight lbs.
30 in. Pruner..	2¾
30 in. Saw.....	1½
72 in. Section..	2
72 in. Section..	1¾
Total Weight....	8

This combination can be quickly and easily assembled to make either of these two tools:
1 Heavy Duty Tree Trimmer (1¼" capacity).... 14½ ft.
1 Fast-cutting Pole Saw ..... 14½ ft
Price F.O.B. Detroit, via Express $27.55

Damage by ice and wind often can be avoided, or the effect lessened, by use of correctly designed pruning tools, bracing materials, and tree wound dressing.

No. 127-24" PARAGON SAW. This curved blade, draw cut pruning saw is ideal for all-around pruning. Best quality saw steel. Easy grip handle. Price Delivered $5.05

This drop-forged tool steel 9-inch Hand Pruner has a crucible steel blade and hardened hook. Unsurpassed. Price Delivered $6.55. Ask for catalog showing a complete line of tools.

BARTLETT MFG. CO.
Box 19—3003 E. Grand Boulevard, Detroit 2, Michigan

MEMBERSHIP APPLICATION

THE AMERICAN FORESTRY ASSOCIATION
919 17TH STREET, N. W., WASHINGTON 6, D. C.

Please enroll me as a Member of The American Forestry Association. Enclosed find $5.00 to cover dues for one year, (Including subscription to AMERICAN FORESTS Magazine). My name and address is:

*Name*_____

*Street*_____

*City and State*_____

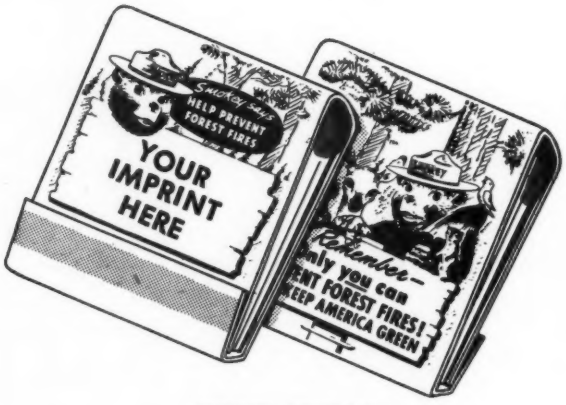
2-55

THAT'S RIGHT, SMOKEY . . .

IT IS OUR RESPONSIBILITY TO PREVENT FOREST FIRES

. . . One good way to help reduce this tragic waste of our country's natural resources is by using Smokey Fire Prevention Bookmatches. Give them to your friends, customers and employees. This is the perfect way to keep fire prevention in their minds . . . and in their hands.

. . . Each time a match is used, Smokey will remind them to be careful . . . and they will also read "your" message or advertisement which is imprinted on each matchbook cover. Sell your service while Smokey teaches fire prevention.



ORDER TODAY

Four cases (10,000 match books), same imprint, same design to one address are only $80.00, transportation prepaid on four cases.

ORDER YOUR FOREST FIRE BOOKMATCHES TODAY — JUST FILL OUT AND MAIL THIS COUPON NOW

Check these Facts:

2,500 match books in each case

4 cases	$ 80.00
10 cases	175.00

Transportation Prepaid

1 case	$ 25.00
2 cases	45.00

Transportation collect

We have two other fire prevention match designs in addition to Smokey. Check here if you would like sample flats. ☐

2-55

THE AMERICAN FORESTRY ASSOCIATION

919 17th Street, N.W., Washington 6, D. C. Date _____

Please enter our order for _____ cases of Smokey Fire Prevention Bookmatches with imprint as shown blow.

Check enclosed ☐ Bill us ☐

IMPRINT SHOULD READ (PLEASE PRINT)

_____

_____

_____

SHIP TO

Name _____

Street _____ City _____ State _____

The World Forestry Congress

(*From page 9*)

have it, some magnetic force brought us elbow to elbow at the counter. Apparently unaware that script books only were legal tender at this bar, the Russian threw down a Rupee note of substantial denomination and muttered some unintelligible order, which brought no results at all. As I was gesticulating for attention with my script book in hand, one of the British, always prepared with free advice, suggested in a whisper that I offer to buy Ivan a drink, so I nudged my neighbor, smiled, and ordered two Vodka Martinis. He looked stiffly straight ahead, with no sound, expression, or change, except increased color, — then suddenly swung around and bolted from the room, leaving his bill on the bar. A day later I passed him on the street leading to the Congress sessions, and he grunted something at me. Although the sound was not distinguishable as idiomatic English, the facial contortions, set of the teeth, and rapid expulsion of breath reminded me of a quaint old Anglo-Saxon term.

The Russians and Red Chinese were conscientious and attentive participants at all of the sessions, field trips, and social gatherings which filled the daily schedule from early morning to late at night. They distributed much material and booklets—largely propaganda stuff, but some of it was good. The Russians displayed a series of motion pictures. One, of pine forests in the drainage of a central river system, stated to be the third largest in continental Europe, following the Danube and the Volga, had excellent forest scenes, and interesting shots of river driving and sorting and utilization. Another dealt with bird life and its importance in controlling insect enemies of the forest. The Red Chinese one day presented 54 blown-up photographic panels illustrating various phases of timber, logging, and milling activities. These were definitely propaganda material, directed at showing the contrast between old and new regimes. Apparently every important statistic is 352 percent better off now than before—and in only three short years!

The Fourth World Forestry Congress had its final session on December 22. The government of France filed an invitation for the next Congress for Paris in 1960. It was felt that this was possibly out of order as the procedure heretofore has been to leave such questions for decision by the member nations of F.A.O. at their next full Conference. Since past Congresses have been held at Rome, Budapest, Helsinki, and Dehra Dun, there is some sentiment and logic in believing that the Fifth should properly be held in the United States. That possibility must await composure of some of the present disturbing international tensions.

The impressions which one gains from a hit and run flight through the Mediterranean, Middle East, and Far East are vivid and puzzling, and often contradictory, but certainly always interesting and challenging.

In all countries visited,—national pride is strong not only for glories of the past, but in recently awakened hopes for the future. Peoples, goods, and ideas literally are on wings,—since the airplane as only one of many media is bridging the gap of countless years and speeding a modern miracle of change.

FOR QUICK ACTION... POWERFUL FOG SPRAY with NEW CHAMPION

Here's a portable fog-type extinguisher for stopping fires quickly before they spread. It consists of a 5-gal. galvanized steel tank with powerful trombone slide-action pump and brass nozzle adjustable from a fog spray to stream. Can be carried as a knapsack or by its handle. 4-ft. hose attaches at top of tank, prevents water from running out when pump is below bottom of tank. Quality-built by manufacturer of dependable spraying equipment since 1915. For complete details and outstanding features of this new Champion . . .

Write today for literature.

CHAMPION SPRAYER CO.

Mfr. Portable Sprayers and Dusters

6501 HEINTZ AVE. • DETROIT 11, MICH.

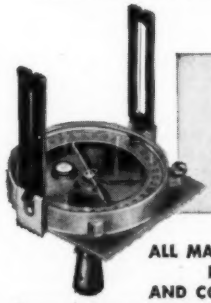
PROFESSIONAL STANDARD OF PRECISION . . .

LEUPOLD *Engineered* COMPASSES

Ask any veteran forester whose job depends on making fast, accurate surveys. He will tell you that LEUPOLD Compasses set a professional standard for accuracy, simplicity and convenience. In no other compasses are dimensions, weight and size of dial so ideally proportioned.

Timber cruisers and foresters select this precision made compass for its compact size and exclusive LEUPOLD features. Needle measures 2½", yet outside maximum diameter of case is only 3¾". Easy-to-read dial is graduated to single degrees and marked for both quadrant and azimuth readings. Coin operated external magnetic declination adjustment. Township plat. **$12.75**

LEUPOLD CRUISER COMPASS



LEUPOLD FORESTER COMPASS

Surveyor's staff compass of highest quality. Furnished with ball and socket joint for mounting on Jacob's staff or tripod. Graduated straight edge for plane table work. Permanently mounted circular spirit level. 3¼" needle. Exclusive LEUPOLD external magnetic declination adjustment. Comes in saddle leather carrying case with belt loop.

MODEL A **$40.00**

MODEL B with vertical angle scale and sight, and 5-min. vernier **$50.00**

Choice of degree, per cent, topographic scale.

ALL MAKES OF SURVEYING INSTRUMENTS AND COMPASSES REPAIRED

Foremost in manufacture of precision engineering instruments since 1907

AT YOUR INSTRUMENT DEALER OR USE THIS MAIL ORDER COUPON

Enclosed is ☐check, ☐M.O. for $_____
send LEUPOLD Compass checked (no c.o.d.)
_____ **CRUISER** @ **$12.75**
_____ **FORESTER,** Model A @ **$40.00**
_____ **FORESTER,** Model B @ **$50.00**
☐Degree, ☐Per cent, or ☐Topographic scale.
Send literature on ☐Compasses, ☐Levels.
Name_____
Address_____
City_____ Zone____ State_____

LEUPOLD & STEVENS INSTRUMENTS, INC.

4445 N. E. GLISAN ST., PORTLAND 13, OREGON

HALE FZZ Centrifugal

Exceeds Requirements

The Hale FZZ Centrifugal Pumping Unit shown below will supply from draft 2 capable fire streams thru 1½" lines. Its performance substantially exceeds the NBFU and NFPA cap. and pressure requirements for portable pumping units. Its companion portable, Type HPZZ, pumps 15 GPM up to 200 lbs.

These compact, rugged, quick-starting units are "workhorses" for fighting forest, brush and field fires. One state forestry department has over fifty of them in service. Their 4 cycle aircooled 8¼ H.P. engine is easy to start in any kind of weather.

Above—FZZ pumping solid stream and fog.

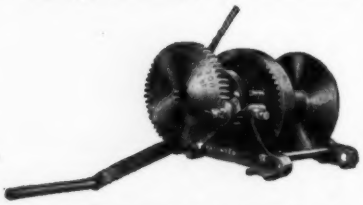
OTHER HALE UNITS

*CFUS 600 U.S. GPM at 120 lbs.
*WF 150 U.S. GPM at 100 lbs.
**NP 15 U.S. GPM at 40 lbs.
*Skid or trailer mtd.
**Self-Priming Portable.

Write for literature on Hale Fire Pumping Units.

HALE FIRE PUMP CO.
CONSHOHOCKEN, PA.

You Can Lift 2 to 15 Tons Easily, Safely, Economically



...With BEEBE Hand Winches

Beebe hand winches are made in 2-, 5-, and 15-ton capacities and eight drum sizes. There is a model for every need. World's leading hand winch. Unconditionally guaranteed unbreakable in hand operation. Easily converted to power. Lighweight 2-ton model weighs only 60 pounds. Write for FREE catalog and case histories showing these winches in operation.

Write for FREE catalog

BEEBE BROS.
2728-6th Ave. So., Seattle, Wash.

Name_____

Address_____

City_____ Zone____ State_____

Foresters in Watershed Movement

(*From page* 47)

These are the main objectives of the program:

Widening and deepening of 14 of the 17 miles of the Little Hoosic to give the seasonal high water more room to run.

Stabilizing the stream banks by sloping them back and planting them with growth that will help resist flooding.

Building a half-dozen "debris basins" in the upper reaches of the river to trap the silt and gravel that is now being carried down by high water to choke the streambed below.

All of this work on stream channels should have only a secondary relationship to the land improvement work—including forestry—which is the real task of these small watershed projects. Such channel work alone does little to cure the basic ailments of the watershed: it is like covering a cancer with a bandage.

These points only serve to emphasize the fact that foresters need to take a thoroughly active part in the development of these small watershed projects. For one thing, over a large part of the United States forest and range lands occupy fully half of any watershed which may be selected as a problem area. Consider a watershed in New York or New England or the Southeast, for example, where woodlots and other forest land cover over half the watershed area; or small drainages heading up in the Wasatch Mountains of Utah, or the San Gabriel Mountains of southern California—where damaging floods are actually generated on the mountain flanks, and run through the communities and irrigated farms below. Certainly foresters and forest land managers need to exert real leadership in the planning and execution of watershed programs in any such areas.

For another thing: long experience, research, and tradition have demonstrated that the good management and protection of forest and range land form the keystone of watershed improvement.

This concept was brought home to me more forcibly than ever, when I recently visited the watershed of Monte Morello, above Florence, Italy. The name of this "Black Mountain" may have been acquired before 1000 A.D., when the upper flanks of the mountain were a dark mass of pine, spruce, and fir. I do not know when this forest first began to disappear; but the greatest demand for wood products was doubtless during the flourishing period of Florentine merchant trade, culminating during the Renaissance. At any rate, after this period the forest was gone. By the 17th and 18th centuries all that was left was a scrubby growth of shrubs and grass —overgrazed by livestock, and subject to flash floods and erosion. By the 19th century, conditions had become so serious that something had to be done. Therefore the Italians in that region began to establish plantations of drought-resistant cypress, cedar, and pine all over the upper flanks of Monte Morello. This was a difficult task. In places the remaining soil was so shallow that dry-rock terraces had to be built to catch enough soil so that the trees could be planted. But as a result, by now Monte Morello is black again. Its upper slopes are once more clothed with a thriving forest cover.

The key fact, of course, in this illustration from Italy is that the reestablishment of good forest conditions must be a dominant feature of watershed improvement—even in a region where cropland cultivation and conservation are as intensively practiced as they are in northern Italy.

"All right," you may be saying, "suppose I grant the validity of your argument. Then what can I do, as a forester interested in watershed improvement?" You can do several things. First, as a general principle, perhaps you can help the Secretary of Agriculture and his people build an increasing consciousness of the place of forest and range lands in small watershed development programs. Then, you can keep track of developments on small-watershed projects in your own area if you are not already doing so. Help exert leadership in the planning and execution of improvement work on forest and range land, as well as on cropland. Try to help shift the emphasis from engineering works to land treatment, especially on forested land. And if you live in an area where definite watershed problems exist and no small-watershed activities are going on, take the leadership in such activities yourself.

The Colorado River Project

(*From page* 16)

tion and that under no circumstances is interested in trying to pervert the spirit of the compact."

Said the same newspaper in an editorial Dec. 14, 1953:

"California has been guilty before of overt acts against upper basin states . . . California has tried to make fifth-columnists of some of the ranchers and farmers of the upper basin. . . .

"According to reports, the offer Gov. Pyle has disclosed was made by Northcutt Ely, a Californian who has been one of the most highly paid lobbyists in Washington . . ."

Ely, special counsel for the Colorado River Board of California, later appeared before the House subcommittee on irrigation and reclamation.

He tried to convince the group that a 1922 report of the Colorado River commission limits to 300,000 acre feet yearly the amount of water which can be diverted from Colorado's western slope to its eastern slope.

Colorado officials ridiculed the argument, pointing out that the nearly-completed Colorado-Big Thompson project alone diverts 310,000 acre feet across the Continental Divide within the Centennial state.

Ely also suggested that upstream diversions would reduce the flow of the river and "there would be that much less water to absorb an increasing quantity of salts in passage to Lee Ferry."

But two of the loudest critics were U. S. Reps. John P. Saylor, Pennsylvania Republican, and Samuel W. Yorty, California Democrat, both members of the House committee on interior and insular affairs.

Saylor attacked all phases of the reclamation program, particularly Echo Park dam, in hearings before that group.

Yorty called for more investigation and study of the entire development and expressed grave concern over repayment of costs to the federal government. (Yorty, whose home is Los Angeles, was defeated in the last election in his bid for the U. S. Senate.)

Yorty's barrage of criticism toward the end of the last Congressional session brought a sharp rebuttal from Rep. Wayne Aspinall, Colorado Democrat.

"We have had enough of bombast and braying," Aspinall declared. "California has received more benefits from federal expenditures for reclamation than any other state in the reclamation West.

"Southern California, including her great shining cities, lives in her greatness because she is largely watered by the Colorado River.

"The great breadbasket of the Imperial Valley is almost entirely watered by the Colorado River. Farther north, her great Central Valley is watered and blessed by the huge Central Valley water project.

"Now this self-same state, ahead in the ever-expanding benefits of basic water development, has the temerity and the gall to rise up in opposition to the legitimate development of the upper basin.

"She continues her death-dealing tactics to put the heat on Colorado and Wyoming and New Mexico—up the river where the water rises."

Aspinall went on to say that the two basins should be working hand

THE LOWTHER
TREE PLANTER PLANTS
10,000 SEEDLINGS PER DAY!

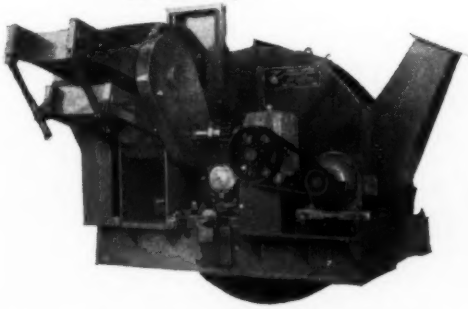
With the Lowther Tree Planter, trees are properly planted for maximum survival in any soil because they have been given the right start.
Three distinct models available to cover all soil conditions and terrain.

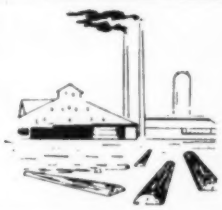
●

For details write:

THE HARRY A. LOWTHER COMPANY
INDUSTRY AVE., JOLIET, ILL.
By The Makers Of The Famous Lowther C-Saw

PRODUCE Quality CHIPS
FROM SAWMILL WASTE
WITH...





... MURCO
MECHANICAL
FEED
WASTEWOOD
CHIPPER

Stop burning dollars . . . start selling chips. You can do as many other lumber producers are now doing. By the use of the MURCO 75" Wastewood Chipper illustrated here, you can produce quality specification-size pulpwood chips from sawmill waste, slabs, edgings, etc. The design of the MURCO 75" Wastewood Chipper incorporates the performance proved features of the standard MURCO Round Wood Chippers plus a newly designed mechanically operated spout for feeding sawmill waste wood into the disc knives at a controlled rate of speed that assures utilization of all the wood yet holds slivers and odd sized chips to minimum . . . either electric motor or Diesel engine drive. Chipper can be equipped with chip blower housing for pneumatic chip conveying if desired. Complete details upon request.

Write for proposal. give us the following information:

- Species of wood to be chipped.
- Number of cords per hour.
- Dimensions of largest slab.
- Will chips be conveyed pneumatically.
- Type of drive desired Diesel or electric

write D. J. MURRAY MANUFACTURING CO.
MANUFACTURERS SINCE 1883
WAUSAU • WISCONSIN

MURCO

For the Control of HARDWOODS & MIXED BRUSH in *Conifer Stands*

Thompson Chemicals

The latest technological development in the use of modern, broad spectrum herbicides is contained in our current STATION PAPER 19. You are invited to write for your free copy.

Thompson's STATION PAPER 19 reports on four years of laboratory and field research of unduplicated magnitude. It covers accurate, important data on both foliage and basal spray techniques, comparative kills by various esters and provides criteria for evaluating costs.

please write to:

Research Department
THOMPSON CHEMICALS CORP.
3030 Locust Street, St. Louis 3, Mo.

We will also be pleased to provide information on specific problems.

SPECIAL OFFER
CHRISTMAS TREE SEEDLINGS

50-Scotch Pine 2 yr.
50-Austrian Pine 2 yr.
50-Austrian Pine 3 yr.
ALL FOR $9.50 Postpaid

Write for price list on larger quantities
SMITH'S FOREST TREE NURSERY
Magnolia, Ohio

in hand on a development that will benefit the entire West.

"Such is emphatically not the case," he added. "Quite the contrary is true. There is a reason the hungry horde in the lower basin wants every possible drop and they want to get this clamp of 'first beneficial use' on it.

"That explains this proclivity to take one's near neighbors to court, to oppose by all available means one's neighbor's development—and at the same time feather one's own political nest irrespective of party so that one can move on to a smaller and possibly more select body—and the proclivity to hide as much of this as possible behind the cleanest possible skirts that can be prostituted for this end.

"We in the upper basin are reaching the limit of our endurance of such machinations."

While vacationing in Colorado last summer, President Eisenhower made an aerial tour of the sometimes-bleak land where men have fought to the death for water.

He pledged that his administration will do "everything feasible and possible to hasten development" of the nation's water and power resources. He went no further.

But the question was put to Vice President Nixon bluntly. Campaigning in Colorado and New Mexico for a Republican Congress just before the last election, the Californian was asked where he stood on the Colorado River storage program.

He replied: "The administration is solidly behind the project, and that includes me."

Nixon was promptly branded a turncoat in an editorial of the *Los Angeles News.*

But even without California, Colorado would be having trouble. Astride the continental divide, the latter state produces 72 percent of the big river's flow.

It has a crying need for this water in cities and on parched farmlands within the state. Yet a recent study by the Los Angeles engineering firm of Leeds, Hill & Jewett showed that Colorado uses 1,450,000 acre feet per year and lets a similar amount flow out of the state as "uncommitted surplus."

Based on this "outside" study, the mushrooming city of Denver last year asked the Colorado water conservation board for its support of a project to tap a stream on the state's west slope for an additional municipal supply.

After a heated intra-state wrangle, the statewide board voted its approval and the Denver project was placed in the Colorado River storage program when it was presented to Congress.

The Denver plan: To divert 177,000 acre feet a year via a 23-mile tunnel through the continental divide from the Blue River, which ironically originates near the town of Breckenridge where Colorado irrigation first started.

Officials of western Colorado objected strenuously to the Denver scheme through all the formal and informal discussions, arguing that the water was created on their side of the mountains and that they would have use for it later.

Denver officials countered that they have need for the water now and that the state constitution provides specifically that there be no ban on diversion of water from one watershed to another if the diversion is for beneficial use.

As if to prove Denver's immediate need, nature wilted Colorado with one of the worst drouths on record last summer—forcing the Mile High City to ban all sprinkling and certain other water uses.

With its stored supplies still shrinking rapidly, the city in November ordered installation by next June of re-circulation and other water-saving devices by all businesses and industries that can re-use the same water in refrigerating, air-conditioning and industrial processing.

PANAMA PRESSURE TYPE TREE MARKING GUN

Approved for use by U.S. Forest Service

Enables an operator to:

Mark more trees with less paint . . . Operate with complete freedom of both hands . . . Automatically clean the tip each time he marks a tree . . . Clean the gun more readily at the end of a day's work . . . Carry his paint on his back instead of in his hands . . . Do a better, faster, more economical marking job . . .

Constantly increasing sales indicate that we have a
SATISFACTORY TREE MARKING GUN

PANAMA PUMP COMPANY
P.O. BOX 689
HATTIESBURG MISS.

To introduce our basal area Angle Gauge (for making Plotless Timber Estimates) we will include one fixed type Angle Gauge with each order received for **PANAMA** *Tree Marking Gun during February, March and April 1955.*

The cry in Denver: "Los Angeles will get the water if you can't use it and we don't."

This fails to silence western Colorado opponents, who voiced their objections before Congress last year and plan to do so again in 1955.

The other upper basin states are unhappy about the situation, but can do little about it. The words of E. L. Larson, regional reclamation director, carry a certain hope—and a certain sting. Describing the storage plan in the House Committee last January, he said:

"It would make utilization of the region's abundant natural resources possible and enrich the economy of the area and the nation.

"Without it, development of these valuable resources (timber, uranium, oil shale) will be hampered, and the growth of the upper basin states will be stunted.

"Through this plan, water would be made available for irrigation, municipal and industrial use, and power generation. It would create vast new recreational facilities and substantial benefits to fish and wildlife.

"It is no exaggeration to say that on it depends the future of the upper Colorado River basin . . ."

That Famous Cherry Tree

(*From page* 17)

body could tell him any thing about it. Presently George and his hatchet made their appearance.

" 'George,' said his father, 'do you know who killed that beautiful little cherry tree yonder in the garden?' This was a difficult question, and George staggered under it for a moment; but quickly recovered himself: and looking at his father, with the sweet face of youth, brightened with the inexpressible charm of all-conquering youth, he bravely cried out, 'I can't tell a lie, Pa; you know I can't tell a lie. I did it with my hatchet.'

" 'Run to my arms, you dearest boy,' cried the father in transports, 'run to my arms; glad am I, George, that you killed my tree; for you have paid me for it a thousand fold. Such an act of heroism in my son is worth more than a thousand trees, though blossomed with silver, and their fruits of purest gold.'

"It was in this way by interesting both his *heart* and *head*, that Mr. Washington conducted George with great ease and pleasure along the happy paths of virtue."

While officially Mt. Vernon and the Mount Vernon Ladies' Association take no notice of the cherry tree legend today, the incident might have taken place there. The handbook of Mount Vernon, sold within the grounds, disposes of Washington's boyhood in two sentences:

"In 1735, when George Washington was three years old, Augustine removed his family from their plantation on Pope's Creek (now officially designated "Washington's Birthplace") in Westmoreland County to the Hunting Creek Plantation. Four years later he moved once again, establishing his household at the Ferry Farm, on the Rappahannock River near Fredericksburg."

Parson Weems, who does not locate the scene of the cherry tree episode, does say that it occurred when Washington was "about six years

"Join THE THOUSANDS WHO DEPEND ON US FOR THEIR EVERY FORESTRY NEED"

BEN C. MEADOWS, President & Manager

- Increment Borers
- Tree Diameter Tapes
- Log Scaling Rules
- Tree Marking Paint
- Surveyor's Instruments
- Mapping Accessories
- Cruiser Sticks
- Compasses
- Snake Bite Kits
- Tally Meters
- Tree Marking Devices
- Fire Suppression Equipt.

WRITE TODAY FOR FREE CATALOG

Consulting Services—Qualified Foresters in Buying, Selling, Conserving Timber

FORESTRY SUPPLIERS INCORPORATED

132 Raymond Road - Battlefield Station

JACKSON, MISSISSIPPI

MORE SEEING PLEASURE FOR YOU

You can thrill to sharply detailed close-up views of distant objects . . . with complete eye comfort in viewing—through a lifetime of exciting pleasure and trouble-free service. It's all for you, if you own a fine binocular—but only a binocular built to the rigid optical and mechanical specifications of a scientific instrument. These are the special qualities of a Bausch & Lomb Binocular, and *no glass which offers less is a bargain at any price.*

How To Choose A Binocular

Bausch & Lomb 7X,35mm Binocular $170.50

The *differences* in binocular design and performance . . . tests you can make before you buy . . . facts that will help you select a binocular best suited to your own use . . . are all explained clearly in a 32-page booklet "Binoculars and How to Choose Them." Your copy is free on request. Write Bausch & Lomb Optical Co., 10738 Lomb Park, Rochester 2, N. Y.

BAUSCH & LOMB SINCE 1853.

TREES FOR SALE

American Arbervitae, Balsam Fir, Red Pine, White Pine, Scotch Pine, Norway Spruce, White Spruce, etc. Prices reasonable and trees are GUARANTEED TO LIVE. Write for FREE Folder.
WESTERN MAINE FOREST NURSERY COMPANY
Dept. F. Fryeburg, Maine

CHRISTMAS TREES
OR FOREST TREES

Turn wasteland into profit. Our famous Christmas Tree Growers' Guide tells you how. Write for free copy.

FREE Catalog

MUSSER FORESTS. BOX 27-B Indiana, Pa.

GROW TREES
FOR XMAS TREES & FORESTRY
Fir, Pine and Spruce in variety
Seedlings and Transplants.
Write for Price List.
SUNCREST
EVERGREEN NURSERIES
Box 305, Homer City, Pa.

TREES FOR FOREST PLANTING
PINE•SPRUCE
Firs, Arborvitaes and Other Conifers. We raise all our trees in our own nurseries.
KEENE FORESTRY ASSOCIATES
KEENE, NEW HAMPSHIRE

SEEDS
TREE - - SHRUB
E. C. MORAN
Stanford, Montana

EVERGREENS
Quality seedlings and transplants for Christmas trees and forest planting.
Write for spring, 1955, price list.
CLEARFIELD BITUMINOUS COAL CORP.
Department of Forests
INDIANA, Indiana Co., PA.

TREES & SHRUBS
Raise your own trees and shrubs from SEEDS. Beautiful Evergreens, lovely trees and shrubs for shade, windbreak, snow fence, erosion control, ornament, etc. For FREE planting guide and price list write
WOODLOT SEED CO., Norway 43, Mich.

When Writing Advertisers—
Please Mention
AMERICAN FORESTS Magazine

NORTHERN GROWN XMAS and Forest Tree Stock. We grow finest stock at lower prices. Write for bulletin and price list.
VANS PINES
Box 12, West Olive, Michigan

old." This, whether he intended it to be or not, is clever timing. George could have been six, or he could have been seven years old. Thus either the Hunting Creek Plantation (Mount Vernon), or Ferry Farm, Fredericksburg, could be claimants to the setting for the story, if either so desires.

But the staff members at Mount Vernon, when asked by visitors to show them the "spot where Washington chopped down the cherry tree," reply politely but firmly, "the incident was a figment of Parson Weems' imagination; absolutely no documentation for it has ever been found."

How well Weems knew Washington is still subject to speculation. From time to time during the last ten years of the 18th Century, when Pohick Church, near Mount Vernon, had no regularly assigned pastor, Parson Weems preached there. Some claim that Washington heard him. Weems himself erroneously refers to Pohick Church as being in "Mount Vernon Parish." No such parish existed, but there can be no doubt that the Washingtons often worshipped at Pohick during the period that Weems served as a pinch-hitting preacher.

We know also that Weems was an intimate of Washington's intimates. He married Fanny Ewell, of Bell Aire, whose mother was a near relative of Washington's. Some believe that she was the anonymous "excellent lady" from whom he received the cherry tree story.

Additional evidence that Washington and Weems were good friends is suggested in the Annual Report (1935) of the Mount Vernon Ladies' Association. Among recent accessions at Mount Vernon the Report lists "a snuff box of shell, mounted in silver, once owned by General Washington. . . . The history of this item indicates that it was given to the Rev. Mason Locke Weems by General Washington."

If Mount Vernon today is reticent about any association with "the cherry tree story," the same cannot be said for Fredericksburg, Virginia, where the young Washington spent the rest of his boyhood. Here the general attitude of the town officials and of local civic and patriotic societies, however, seems to be about midway between regarding the episode as legend, and "it might have happened."

At nearby Ferry Farm, for instance, where Washington spent nearly eight years of his young manhood, a stone marker bears a metal plate with the following inscription:

WASHINGTON CHERRY TREE. Beside this stone stood the cherry tree which, according to tradition, George Washington, when a boy, cut down. The present cherry tree was planted by the Fredericksburg Chamber of Commerce, February 22, 1935.

This small stone memorial is on the brow of the hill just behind a fairly modern house, built on or near the site of the original Washington boyhood home.

Along Virginia State Route 3, at the entrance to Ferry Farm, an official State Historical marker reads:

WASHINGTON'S BOYHOOD HOME. At this place, George Washington lived most of the time from 1739 to 1747. Here, according to tradition, he cut down the cherry tree. Washington's father died here in 1743; the farm was his share of the paternal estate. His mother lived here until 1771.

Note that both of these markers refer to the cherry tree as having been "cut down," although Weems himself describes the hatchet job only as a "barking" operation, albeit a rather devastating one. Perhaps new light may be shed on this and other phases of Washington's youth when the farm is studied and restored by George Washington Boyhood Home, Inc., a patriotic, nonprofit organization which took over the property in 1954, and saved the original farm from being cut up into building lots.

The reactions, or lack of them, of historians to the cherry tree story in recent years are as interesting as they are varied. Paul Wilstach, for instance, is pleased "to see this piece of boyish heroism growing again into some standing after the long reaction against its acceptance." Douglas Southall Freeman, on the other hand, obviously wants to blot it out. In the introduction to his monumental new biography of Washington, a most painstaking and scholarly work, he deprecates "the cherry tree myth" as "wholly fictitious." Gerald W. Johnson makes only a passing reference to Parson Weems, and no mention of cherry trees.

Norwood Young cautions: "It is of course possible that the anecdote was not invented by Weems. One bit of evidence that the story, at least, was in circulation before Weems printed it in 1806 derives from an illustration in a book entitled 'Pictures of Early New York on Dark Blue Staffordshire Pottery'

by R. T. Haines Haley, 1899. It shows a china mug on which appears the figure of a boy hitting a tree with a hatchet, with the initials 'G.W.' and '1776.' The date is probably that of manufacture, and, if so, the story was in circulation a quarter of a century before Weems printed it."

Young goes on to point out that when doubts were cast upon some of the anecdotes and legends Weems used in his 1806 and subsequent editions, Weems admitted that he had made some of them up "for the sake of their moral teaching, but he never said whether the cherry tree was one of them or not."

One of the most interesting of the many chroniclers of Washington's life, Moncure D. Conway, places the cherry tree story among what he calls "Washington mythology, a folklore such as must always invest the founders of nations or men of the people," adding, "Washington is entitled to his Washington-lore, by which, indeed, he is rather draped than disguised."

Pacific Salmon

(*From page* 23)

If you could accurately evaluate the salmon sport fishery, it is possible that it would be found to be of more value than the commercial fishery. Each state on the river issues thousands of resident and non-resident sport-fishing licenses; Oregon, more than 300,000, Washington, more than 450,000. License fees in the two states amount to nearly 22 million dollars.

How long the salmon fishery of the Pacific Northwest can return such economic and recreational dividends is a matter of conjecture. The only spawning areas on the Columbia River that can be easily reached by migrating salmon are those in a very small part of the watershed at the river's mouth. Most salmon migrating up the Columbia have to get over one or more major dams to reach their spawning grounds, though some dams, like Chief Joseph on the upper Columbia or Swan Falls on the Snake, can *not* be passed. Fish wishing to spawn in the Salmon River in Idaho must get over Bonneville, The Dalles, and McNary Dams, while those headed for the upper Columbia must also get over Rock Island Dam. Other spawning areas on tributaries like the Okanogan, the Yakima, and the Willamette, have dams or diversions that impede or block migrating salmon and steelhead trout.

There appears to be some hope for adequate consideration of the salmon resources of the Columbia River basin through the recently organized Columbia Interstate Compact Commission. The function of this organization is to prepare and to review plans for the development and application of measures for preventing damage to the fish and wildlife resources of the Columbia River area in connection with the development of power and irrigation for the growing population of the Northwest. If the recommendations of the Commission are put into effect, the runs of the Pacific salmon on the Columbia — a resource that needs only the right environment to continue to provide perpetual income and recreation for the nation — can be maintained indefinitely.

Myrtle

the perfect ground cover for banks and shady places

100 Big Clumps $13.00 (1000, $98)

For hard-to-mow places plant Myrtle (Vinca Minor), the sturdy, neat ground cover that stays green all winter. Beautiful blue flowers in May. Resists insects and disease. Our big, heavy clumps with 12 or more stems can be planted 2 ft. apart on level, 1½ ft. on slopes. You cover large areas for little money.

DWARF FRUITS

Apples Apricots Cherries
Pears Peaches Plums
Big bearers—easy spray & pick
2-year-old *Any two* $8.00
3-year-old *Any two* $10.50

KELSEY NURSERY SERVICE
Highlands, N. J. Dept. D-3

— ROOT BRANCHES IN MID-AIR —
Send only $1.00 for my proven Branch Rooting Pack postpaid with easy instructions and metallic wrappers for 10 branches. 3 Packs For $2.00 Postpaid — Success Guaranteed.
ROBBINS GARDENS — Sec. 11
P. O. Box 1363 Jacksonville, Florida

20 MILLION TREES A YEAR!

THIS ASTOUNDING VOLUME OF MUSSER TREES ARE SUCCESSFULLY PLANTED EACH YEAR IN 48 STATES

MUSSER TREES GROW

Our careful selection of seed, good heredity characteristics, scientific methods of planting and propagation result in Heavy Roots and Sturdy Tops that rapidly develop into beautiful trees.

QUALITY PLUS VOLUME

Buying wholesale directly from one of America's largest growers you profit from the economies our huge volume makes possible.

FOR EXAMPLE
SCOTCH PINE, seedlings per 1000
2 yr. 2-4" (Riga) $15.00
2 yr. 5-10" (Special Strain) $35.00

WHITE PINE, seedlings per 1000
2 yr. 3-6" $20.00
3 yr. 6-10" $30.00

AUSTRIAN PINE, seedlings per 1000
2 yr. 2-4" $25.00
3 yr. 8-12" $40.00

Write for Catalog..

and wholesale price list. Ask for our Famous Christmas Tree Growers' Guide.

SEE THE DIFFERENCE —
Fred Musser compares a Musser seedling, right of photo, with an ordinary seedling.

MUSSER FORESTS, Inc. BOX 27-B INDIANA, PA.

ALTIMETER "HAGA"

Aim at the tree top and read the height direct from the scale. Errors eliminated.

Easy to handle. Most accurate and quick results. Write for Free Booklet

Price with leather case & shoulder straps ____ **$28**

Range-finder available____ **$14**

Delivered C.O.D. or send check with order

Sole Agent **Wm. A. Wolff**
3106 Champion Street
Oakland 2, California

SAWDUST MAKES GOOD FERTILIZER

You can apply 15 tons of sawdust per acre to build rich top-soil rapidly, and greatly increase nitrogen level, if you use the ActivO process. Cheaper, more permanent, and better soil condition than with chemical fertilizer. No compost-heap making. Apply now; anytime. Rush postcard for free bulletin, "How to Turn Sawdust into Gold." Buy ActivO at dealers, $1 to $195.00.

THE ACTIVO PROCESS, Bridgeton 36, Ind.

PREVENT FOREST FIRES
FOLLOW THESE RULES:

1. Hold your match 'til it's cold—then pinch it to make sure.
2. Crush out your cigarette, cigar, pipe ashes. Use an ash tray!
3. Drown your campfire, then stir and drown again.
4. Ask about the law before burning grass, brush, fence rows, or trash.

The Lake Man Couldn't Tame

(*From page* 31)

the lake bed and was called New Holland because of similar projects in Holland.

The promoters were right about one thing, the heavy black soil of the lake produced bumper crops: corn, rice, soybeans, and vegetables. But an assortment of troubles plagued the men. Pump failure prevented the machinery from harvesting the crops and invasion of pests destroyed food before it could be harvested. The project was abandoned in 1933 and the animals returned to their former homes.

The federal government acquired the property in 1934 and established a refuge. The pumping station was made into a lodge to be operated under a lease. The 120-foot smokestack became an observation tower that afforded a magnificent view of the entire refuge.

There are many different kinds of fish in the shallow waters: white perch, black bass, crappie, and carp. On the shores small animals are plentiful such as deer, foxes, raccoons, opossums, mink, and even bears.

Thousands of geese and swans are often in sight at one time. Whistling swans, with a wing spread of six to seven feet, are the most spectacular birds. They arrive in November and begin their northern migration in February. Five to ten thousand swans are at the lake in the wintertime. They feed in the shallow water areas on the southern and eastern shores.

The Canada geese are the largest number of wildlife that visit the refuge. There are between 40,000 and 60,000 from October to March.

The ducks are largely marsh or dabbling ducks; shallow-water feeders. The pintail is the commonest; 10,000 or more may sometimes be seen above the marshes. Wigeons appear in the spring, along the lake road. In the winter there are also black ducks, green-winged teal, mallards, and blue-winged teal.

There are about 200 different species of birdlife at the refuge with water and water-loving land birds predominating. Parts of former canals reach out in long, thickly grown peninsulas into the lake and are ideal for watching birds. More and more bird watchers come each year to Mattamuskeet.

Marsh birds that are common are the great blue heron that stays throughout the year, the American bittern that stays only in the winter, and the summer residents— the least bittern, the green and blue herons, and the American egret.

Fastest Growing Tree?

What is the fastest growing tree on record in the United States? This is the question Richard H. Pough, of the American Museum of Natural History, Central Park West at 79th Street, New York 24, is asking as the museum puts the finishing touches on its remarkable tree anatomy exhibit. People who write to him on the subject had also better be prepared to comment on whether a cross-section of the tree is available for the museum.

Mr. Pough also revealed last month that the museum is looking for a fine cross-section for its tree ring exhibit. Said Mr. Pough, "For our tree ring exhibit we are asking for discs from 12 to 18 inches and, of course, would settle for something smaller that showed phenomenal growth. For our tree anatomy exhibit we want a young tree not over six or seven inches in diameter at the base with a first limb at about five or six feet. We wish to excavate the root system so that we can cross-section not only the trunk and the branch but the tap root longitudinally down the center."

SANDVIK BOW SAWS
MAKE HARD WORK EASY!
SANDVIK BOW SAWS lead in quality and performance, are always dependable and materially assist in reducing operating costs. FRAMES of lightweight Steel Tubing, SAWS made from best procurable saw Steel, thin back, fast and easy cutting.

Send for Descriptive Folder F

Sandvik Saw & Tool
DIVISION OF SANDVIK STEEL
47 WARREN ST. NEW YORK 7, N. Y.

AN UNFORGETTABLE EXPERIENCE!

VACATION this summer in the wilderness. Join the Trail Riders of the Wilderness on an expedition into the wild rugged back country of our forests and parks. See for yourself the magnificent beauty of the primitive wilderness as you ride the narrow trails . . . fish in lakes and streams . . . climb the mountain or hike around the lake . . . enjoy the companionship of fellow riders . . . relax beside the evening campfire . . . sleep soundly under a canopy of stars; and return to civilization refreshed and vigorous to tackle the job ahead. That can be your vacation with the Trail Riders . . . AN UNFORGETTABLE EXPERIENCE. Here is the tentative schedule for 1955.

FLATHEAD-SUN RIVER WILDERNESS, MONTANA
July 5 to July 16; July 16 to July 27
$215 from Missoula, Montana. Parties limited to 25

QUETICO-SUPERIOR WILDERNESS, MINNESOTA
(Canoe Trip)
July 9 to July 18
$200 from Ely, Minnesota. Party limited to 17

WIND RIVER WILDERNESS, WYOMING
July 10 to July 22
$230 from Pinedale, Wyoming. Party limited to 15

HIGH UINTAS WILDERNESS, UTAH
July 26 to August 5
$220 from Vernal, Utah. Party limited to 28

SAWTOOTH WILDERNESS, IDAHO
July 26 to August 5; August 9 to August 19
$215 from Sun Valley, Idaho. Parties limited to 28

MAROON BELLS-SNOWMASS WILDERNESS, COLORADO
July 29 to August 8; August 12 to August 22
$220 from Glenwood Springs, Colorado.
Parties limited to 28

SAN JUAN WILDERNESS, COLORADO
August 12 to August 22; August 28 to September 7
$220 from Durango, Colorado. Parties limited to 25

MOUNT RAINIER NATIONAL PARK, WASHINGTON
August 10 to August 20
$215 from Mt. Rainier National Park, Washington.
Party limited to 28

GLACIER PEAK-LAKE CHELAN WILDERNESS, WASHINGTON
August 22 to September 2
$215 from Wenatchee, Washington.
Party limited to 28

SEQUOIA-MOUNT WHITNEY WILDERNESS, CALIFORNIA
September 1 to September 10
$215 from Lone Pine, California. Party limited to 20

PECOS WILDERNESS, NEW MEXICO
September 7 to September 18
$220 from Santa Fe, New Mexico. Party limited to 28

GREAT SMOKIES SADDLE TRIP AGAIN OFFERED

The spring saddle trips in the Great Smoky Mountains National Park, North Carolina, have been so successful that The American Forestry Association has scheduled another one this year for the dates of May 25 to June 4. Headquarters for the party of 20 will be the well-appointed Cataloochee Ranch, situated on the border of the Park. The itinerary calls for a three-day pack trip with interesting rides from a base camp, including a ride to the crest of Mt. Sterling. Seven nights will be spent at the ranch with daily rides to Sheepback Lookoff, Purchase Mountain, Paul's Gap, Balsam Mountain and other interesting points. Square dancing will be the feature of the evening on the last night of the trip.

If you would dispel the memories of winter's snow and ice, then plan to ride in Smoky land this spring when the colorful wildflowers and flowering trees are in bloom. The cost of the expedition is $185, from Asheville, North Carolina.

Write or wire for detailed information itineraries, and reservations.

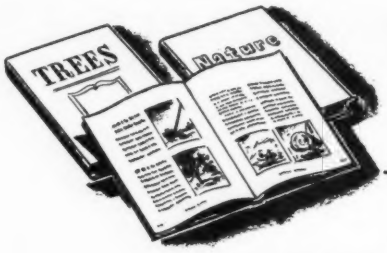
THE AMERICAN FORESTRY ASSOCIATION
919 Seventeenth Street, N. W. Washington 6, D. C.

AFA MEMBERSHIP

Any person, organization, or company may become a member of The American Forestry Association upon application. There are five classes of Membership:

1.	Subscribing, per year	$ 5
2.	Contributing, per year ..	10
3.	Sustaining (individuals, organizations, or companies) minimum per year	25
4.	Life (individuals only) no further dues	100
5.	Patron (for individuals) no further dues	1000

All members receive monthly copies of *AMERICAN FORESTS* Magazine.



Reading About CONSERVATION

By ARTHUR B. MEYER

OVER a year ago Arthur H. Carhart set out to write a book that would dramatize the story of forests in our life. In coming back to this subject after years of successful authorship on wildlife, parks and a myriad of other conservation subjects, author Carhart was returning to his first love. For this former landscape architect and Forest Service employee has always seen the forests and their sound management as the cornerstone in our economy and way of life. Despoil them and you you have little left in his judgment —water, wildlife, recreation and all their other uses. To him, forests have always been first in importance in the resources scheme of things. Also, in recent years he has had an uneasy feeling that the public at large has not fully grasped the basic importance of this key resource. A need existed, he thought, to break through the communications sound barrier that exists between the professionals in the conservation world and the public itself.

To do this, Carhart pretty much divested himself of other (and usually more profitable) assignments for a year to put in his full time on travel, research and organization of facts. He was well aware from the first that he would not be completely successful. As he says, "Any attempt to bring together all the vistas of what is happening in our forests would be like standing on a shoreline and trying to see all the parts of a great ocean." His goal was somewhat more modest. It was ". . . to grasp some actuality of the whole as you gaze at some of its details."

Last month the public was getting its first glimpse of Mr. Carhart's findings (*Timber in Your Life*, J. B. Lippincott Co., 317 pages, $4). It shows that the author has chosen well in selecting these details that are likely to strike the average reader with the greatest impact. He has succeeded in producing a readable book on a complicated and technical subject. He has succeeded in dramatizing the story of forests in our life and in giving readers more than a mere glimpse of the complex relationships of the various integral parts in the whole conservation picture. The author's general attitude is that accomplishments in forest conservation and management during the past 50 years are reassuring, but that there is no call for complacency regarding our timber resources, "their adequacy, their future productive capacities." This is a sound approach. It is generally maintained throughout the book, without relying on startling statements, more designed to catch readers than to convey facts. Critical readers may feel that some knotty

BERNARD Kamp-Pack

"OUTDOOR FOOD" HELPS RANGERS, FORESTERS, TRAVEL LIGHT and FAST

Delicious non-perishable food is concentrated for easy carrying. 25 pounds finished food weighs only 9 pounds. Nothing to add but water. 12 full meals in waterproof foil packets. Used by forest rangers as regular food for lookouts, emergency food when fire-fighting. Used by foresters, too.

Write for KAMP-PACK booklet and Bernard INSTITUTIONAL FOOD LISTS for *he-man* lumberjack meals.

BERNARD FOOD INDUSTRIES . . . 2 plants to serve you

P O. Box 487, San Jose, Calif. • 559 West Fulton Street, Chicago 6, Ill.

Eddie BAUER
America's Finest SLEEPING BAGS
FACTORY TO YOU ONLY!
Sold direct only—never through Dealers or Middlemen
ORDER BY MAIL
SAVE 1/3
ON THE FINEST BAGS MADE
19 kinds and styles—Singles, Twins & Mummies—of DOWN, DACRON, WOOL or KAPOK. From $10.50 to $89.50.
GUARANTEE
You be the judge. Order any of our sleeping robes or bags. Compare with any other make. If you do not agree ours are by far the finer quality and far better value, return for full and prompt refund...including shipping costs both ways.
FREE 36-Page Catalog
Includes Sleeping Bags, Down Clothing Comforters, Camp Beds, etc.
Eddie BAUER Dept. A . 160 Jackson St. SEATTLE 4, WASH.
WRITE TODAY

matters are too easily skimmed over. On the other hand, one must not expect the general public to sit down and gnaw on knotty problems, and an author who can catch attention and push some basic concepts across has achieved no mean goal. Carhart has done this in a book that took him over a year to research and write.

The book opens with a discussion on how wood serves us. It demonstrates that eventually, if not quite yet, the crucial question is going to be whether we have enough, in total and in the kinds necessary, for various uses. Carhart then goes into the history of forests and forestry in this country. He cites pioneer agricultural expansion and the prodigal lumbering of the early days. He doesn't set up the awful lumber baron as the cause of all our ills. In fact he repeatedly credits industrial leaders over the years for bringing us to a point where industry is recognized generally as a potent force for wise forest use. He takes a considered view of the needs of the times and the limits of knowledge in the period when the wilderness was pushed back with violence.

The fight to establish the national forests is told in some detail. The parts played by early leaders, Teddy Roosevelt, Gifford Pinchot, and the leaders of The American Forestry Association, are covered, as are actions by various individuals and groups that fought to defeat the movement. A major portion of this story is, of course, intimately tied in with the history of the U. S. Forest Service. This history is threaded throughout the book from the standpoint of national legislation and policy. It is dealt with interestingly and in telling fashion, by devoting a chapter to early day rangers in the Service and following this with a chapter on what a modern ranger does. This is to set the record straight. Many people, Carhart indicates, seem to feel that this mythical person is on a perpetual vacation — hunting, fishing, and admiring the scenery. Actually, of course, the position bearing this title in the Service is one of heavy and diverse administrative responsibilities. It requires both executive and technical ability, a knack for handling people, and a devotion to the job. In this chapter, Carhart brings the time element of the book back to the present. In following chapters he discusses growth of individual trees, forest wildlife, the development of the concept of recreational use in the national forests, the relations of forests to water resources, and protection of the forests from fire and from insects and disease.

One chapter, "Concerning the Land Grab Gang," discusses recent efforts to secure the passage of legislation in Congress dealing with the use of national forest range lands in the West by private livestock owners. Attempts to enact such legislation in the 83rd Congress, both in 1953 and 1954, failed. Defeat is credited to conservation organizations and to individuals who felt that its passage would give vested rights in the publicly owned lands to private interests. Carhart says this will be a continuing fight. He takes vigorous issue with the proponents, but says that the agitation for such Congressional action arises from a small, selfish element in the livestock industry which is by no means representative of that industry.

Under the headings, "Our Hidden Forest" and "Something Just as Good," two major points are brought out about wood utilization. The first is that over half of all commercial timber cut each year winds up as waste. This begins when the sawlog is cut out of the felled tree. It progresses all down the line as slabs, sawdust, odd lumber lengths, and so on are thrown into the trash heap. Research is underway to avoid waste, but more is needed. The second point made is that we cannot expect our demand for wood to decrease. Many present substitutes for

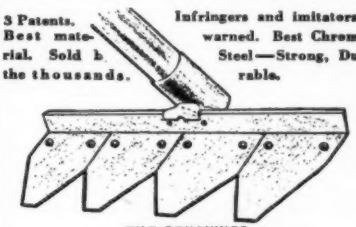
JOHN B. WOODS & SON

REFORESTATION
CONSULTANTS—CONTRACTORS
FOREST NURSERIES
PRODUCERS OF WOODSEED

"Thirty years of Industrial Forestry Experience in the Pacific Northwest."

Post Office Box 647
Salem, Oregon, U.S.A.

3 Patents. Best material. Sold by the thousands. Infringers and imitators warned. Best Chrome Steel—Strong, Durable.



THE RENOWNED
CHARLES H. RICH
"Forest Fire Fighting Tool"
Write for Prices and Descriptions
Geneva Rich Bickel WOOLRICH, PA.
Phone: 2171

SILVA COMPASS
Simpler — More Accurate
Recommended by foresters for cruising. Easier to use, faster, positive. Direct course readings. *Write for free literature and instructions.*
SILVA, INC., Dept. A LaPorte, Ind.

RANGER MODEL

When Writing Our Advertisers Please Mention AMERICAN FORESTS

LITTLE BEAVER TREE GIRDLER and Attachments

Little Beaver Tree Girdler, cuts girdle around tree at walking speed. One man will girdle more acres per day than several men using other methods.

Brush and Pruning Saw attachments to take care of any brush cutting or pruning job, four foot sections may be added to get desired height. Brush saw does the work of several men.

A Post Hole Auger designed for one man operation, doing the work of heavy equipment diggers, holes quickly and easily made in any soil type. Wood auger may be attached for wood drilling.

HAYNES TREE GIRDLER Little Beaver

FOR DETAILS SEE YOUR DEALER OR WRITE:
HAYNES MFG. CO. LIVINGSTON, TEXAS, U. S. A.

Official
U. S. FOREST SERVICE
FIELD CLOTHES
Also
UNIFORMS
For Rough Field Wear
Complete price list on request
The Fechheimer Bros. Co.
Uniforms for Over 70 Years
CINCINNATI 2, OHIO

Cutting Tools for weeds, brush, briars. Light, easy to use. Save your back in farm and forests. Razor sharp, safe. Write for free illustrated folder.
$2.95 up

VICTOR TOOL CO., OLEY 402, PA.

When Writing Advertisers—
Please Mention
AMERICAN FORESTS
Magazine

Bequests
to
THE AMERICAN
FORESTRY ASSOCIATION

•

There are many members and friends of the Association who find it impractical to contribute to its educational activities during their lifetime. Gifts in the form of a bequest are welcomed. Officers of the Association will gladly consult at any time with those who wish to know more about designating gifts for educational work in forest conservation.

Following is a paragraph suitable for incorporation in wills:

"I hereby give, devise and bequeath _____ to The American Forestry Association, Washington, D. C., a nonprofit District of Columbia corporation, or its successor, or successors, for the purpose of promoting the corporate activities of said Association."

wood have in turn demanded new uses for wood. Look at the wood required to pour the concrete for a skyscraper. Also, new uses for wood are being found daily. Its processing into new forms by modern technology is probably a field that has only been scratched. Furthermore, most of the substitutes for wood now in use come from nonrenewable resources that may sometime be in short supply. Wood, on the other hand, can be grown as a crop.

In his last two chapters Carhart reviews the present status of the forest picture and its implications for the future.

The national forests, something a little over one-fifth of the country's forest land, are in good hands and are beginning to really show the benefits of a half-century of management, he thinks. This management has been as effective as conditions permitted. There is an acreage of forest land (excluding parks and wildlife refuges) about equal to that in the hands of other federal agencies. In general, these lands need to be brought under more efficient management programs to obtain maximum forest benefits, Carhart says.

Industrial holdings are being given increasingly better management. It can be expected that this definite, present trend will continue, he thinks.

However, about 75 percent of all forest lands not in public ownership are in small, individual holdings. These lands are receiving the poorest management and yet we must look to them to supply the bulk of future needs, Carhart says. Public and industrial lands can only supply a portion of those needs, he adds.

As far as present utilization goes, our annual cut in cubic feet is about equivalent to present annual growth. In terms of sawtimber, though—one of the most vital uses—cut exceeds growth "between one and a half and two times." In other words too much of our present growth is being laid down on trees of inferior species, cull trees, and young timber too small for conversion into lumber. This situation must be viewed in the light of forecasts that call for increased demands for all forms of wood in the future.

We must manage our forests more efficiently, Carhart declares. We need to utilize them more efficiently and completely. In so far as wood supplies go we are not presently in a dangerous situation, but we could conceivably get into one if we don't accelerate the rate of past improvement in management and utilization. Furthermore, we must keep in mind the vital functions of forests in addition to wood production, in protecting water supplies, producing wildlife, and providing facilities for recreation. These demands, too, will increase.

It is a little disappointing to find the author referring to the "twenty-two recognized colleges of forestry in the United States" when there had been 25 so recognized for some time previous to the book's publication. His record of the succession of tree species coming in on an abandoned farm in Connecticut might give a reader an unduly compressed picture of nature in the process of building up a worn out soil and re-covering it with climax species. Sometimes the continuity of progression in the book is hard to follow. In a rather drawn out introduction, Bernard DeVoto, one of our favorite writers, seems to be quite provoked with someone, which is his privilege, but this isn't in the same vein as the general tone of the book.

Timber in Your Life is a good book and will accomplish, to some extent at least, the mission the author assigned himself. In his selection of what is most dramatic in appeal to the mass public and his elimination of details somewhat less so, he will not entirely satisfy the professional conservationist. The fact remains, however, that he has had commendable success in fitting together the complicated pieces of a nation's forestry picture at mid-century.

Practice of Silviculture

Since 1921, *The Practice of Silviculture* by Ralph C. Hawley has been a standard in its field. The sixth edition (John Wiley & Sons, 525 pp., $7.50) prepared with the coauthorship of David M. Smith, is now on the market. It presents "a substantial increase in the amount of attention devoted to the biological laws and economic objectives that underlie the principles of silviculture and govern their application."

First Aid

Any outdoorsman, in fact anybody, will find a new U. S. Forest Service booklet a valuable acquisition. *First Aid Guide* (Superintendent of Documents, Washington, D. C., 57 pp., 20c) is cut to fit in the pocket like a notebook. It has few words and much information, organized for hasty reference.

TIME MAGAZINE, IN ITS JANUARY 31 ISSUE, GIVES CONSIDERABLE SPACE TO THE COLORADO river storage project (See American Forests' story on page 14). Time hints that President Eisenhower's request in his Budget message for $5 million to get engineering work started on the project was a sort of repayment to Sen. Arthur V. Watkins for the Utahn's part in handling the censure move against Sen. Joseph R. McCarthy of Wisconsin. After establishing this premise, Time goes on to say: "Ike's powerful support was thereby given to a plan which has been talked about for some 50 years and has been passed over by four previous Congresses largely because of unrelenting opposition from 1) Southern California power interests who profit under the present distribution of Colorado River water and 2) conservationists . . . who for years charged that the big dam proposed for Echo Park would flood out the dinosaur remains in the national park there. They have since shifted their arguments to the claim that if Dinosaur National Monument is invaded today, Yellowstone will be tomorrow's victim."

TO THIS TIME ADDS: "To the conservationists, Interior Secretary Douglas McKay has a trenchant answer. Says he: 'As it now is now, 2200 people a year see that park. On the other hand, more than 3,000,000 people live in the Upper Colorado Basin states and they are hungry for water. Which is the more important?'"

THE MAGAZINE ARTICLE CONCLUDES WITH THIS STATEMENT: "Insofar as the Administration is concerned, the Upper Colorado Basin has another great virtue. The people of the area want water; how they get it is less important. Missing, to a large extent, is the highly emotional issue of public v. private power that hampers reasonable discussion of power development in the Pacific Northwest. Administration advisors feel that they can make the Upper Colorado a showcase for their policies on power development. If so, they consider it well worth braving the wrath of Dinosaur fanciers and Southern California."

TO CREATE PUBLIC INTEREST IN THE WISE USE OF FOREST RESOURCES, the Committee on Conservation of the University of Washington College of Forestry is making plans for a Conservation Week to be held April 17-25. Theme of the week will be "Wise Use." During the week the Committee will give widespread publicity to sound forestry philosophy through posters, radio and television programs, newspapers and magazines.

STATISTICAL METHODS OF QUALITY CONTROL HAVE PROVED AN INVALUABLE ENGINEERING tool in the leading wood industries of the country, according to Dr. Aubrey E. Wylie, of the New York State University College of Forestry, who recently announced a short course in quality control for persons in the wood industry which will be held at the college April 12-16. The five-day course is planned for managers, engineers, and technologists in the wood-using industry. The program will include lectures, explanations, demonstrations, and exercises, supervised by faculty members of the New York State University College of Forestry and Syracuse University and by quality control supervisors from industry.

THE TREMENDOUS PROGRESS MADE BY THE SOUTHERN PINE INDUSTRY in reforestation and forest management is reflected in figures released recently by the American Forest Products Industries, Inc. The figures show that the South has more tree farms and more tree farm acreage than all other sections of the nation

(Turn to next page)

combined. Total U. S. tree farm acreage is 33,692,964 acres, and 20,668,000 of them — 61 percent — are located in 11 Southern states: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia. In all there are 6063 tree farms in the nation and the South has 3157 — or 52 percent. The South also far outstripped all other sections of the nation in progress in the tree farms movement for the year 1954, according to the AFPI report. During the year 585 new tree farms and 2,742,587 acres were added by the 11 states.

PRODUCTION CAPACITY OF THE PAPER INDUSTRY WILL BE AN ESTIMATED MINIMUM of 30,443,000 tons by the end of 1960, E. W. Tinker, executive secretary of the American Paper and Pulp Association, predicted last month. This is an increase of 1,252,090 tons over the capacity at the end of 1954, with paper capacity increasing 703,080 tons and paperboard 549,010 tons. These data, Tinker said, are based on the Association's recently-completed capacity survey covering all major grades of paper and board. In the paper group, newsprint showed the greatest increase, 165,540 tons, and in the board group, container board, 266,290 tons.

SINCE 1946, WHEN ALL WORLD WAR II CONTROLS WERE LIFTED, the industry's capacity increased from 20,420,000 tons to 29,190,500 tons at the end of last year. During these years, the industry's production rate has averaged over 90 percent of capacity, indicating that the industry's capacity has grown in line with the country's needs.

INDUSTRY REPORTS ON NATURAL RESOURCES, a recently published booklet written by members of the Natural Resources Committee of the Chamber of Commerce of the United States, states that despite drastic ups and downs during the year by the end of 1954 the lumber market returned to "normal" — "a state of fierce competition among all and narrowing profit margins among many." The report states further: "Just like the frog who jumped up three steps only to fall back two, productive capacity of the industry has managed to maintain a narrow, but significant, lead over ever-increasing sales. Lumber production has been at or close to record figures since 1950. Douglasfir plywood production, which accounts for over two-thirds of the nation's plywood output, is up 50 percent in the same period, and is still growing." To meet the challenge of greater productive capacity, the report says the industry is turning to hard selling, research, and promotion.

MORE THAN 15,165,000 PERSONS ENTERED MICHIGAN'S 57 STATE PARKS and recreation areas in 1954, an all-time record total attendance. In setting the record during 1954, most parks showed an increase in use, though a number showed some decreases. The biggest increase was at Sterling state park where attendance nearly doubled. The state legislature recently appropriated $300,000 for further development of this southeastern Michigan park. Other parks and recreation areas that showed a sharp increase included Young, Pontiac, Algonac, Holly, Hayes, Ortonville and Ludington state parks and Island Lake and Rochester-Utica recreation areas.

HOW TO PRESERVE FOREVER THE FEW REMAINING EXAMPLES OF THE NATION'S once extensive primeval wilderness will be the big question at the Fourth Biennial Wilderness Conference March 18-19 in Berkeley, California. The conference will bring together, under sponsorship of the Sierra Club, those who seek preservation of the special values the wilderness has for conservationists, scientists, recreation and youth groups, sportsmen, packers, hikers and others. The club points out that at present only three-fourths of one percent of the total area of the United States remains in its completely natural state, other than the areas set aside in 28 national parks and some national monuments primarily to preserve outstanding scenic wonders. These surviving wild lands are contained in 79 separate primitive, wilderness, and wild areas in 12 states. They are in custody of the U. S. Forest Service.

LARRY F. LIVINGSTON, FOR MANY YEARS A DIRECTOR OF THE AMERICAN FORESTRY ASSOCIATION, retired recently as manager of the Du Pont Company's extension division in the public relations department. Widely known throughout the nation as a speaker on industrial progress through chemical developments, Mr. Livingston made more than 2500 speeches during his 26 years with Du Pont. He appeared in every state in the Union and in several foreign nations giving lecture-demonstrations on the development of industry and, particularly, the American chemical industry.

McCaffrey Cites Chailenge Facing Pulp-Paper Industry in South

THE tremendous challenge faced by pulp and paper in the South in producing sufficient wood pulp to meet anticipated future demands was underscored by J. E. McCaffrey, vice president of the International Paper Company, at the annual meeting of the Southern Pulpwood Conservation Association last month in Atlanta, Georgia.

Quoting the Stanford Research Institute Report sponsored by the Weyerhaeuser Timber Company, Mr. McCaffrey said the South, which used approximately 14.5 million cords of pulpwood in 1952, will probably be using 30 million cords a year by 1975—an increase of 107 percent. This, of course, is in addition to anticipated increases for lumber, poles, and all other products—all which adds up to the fact that "there is going to be competition such as we have never seen for the tree growing on the other fellow's land."

As an organization, the Southern Pulpwood Conservation Association in recent years has shown scant interest in resting on its laurels, which are not inconsiderable. The efforts of this industry-sponsored group have been directed toward the task of taking good woodland management right to the landowner. The results have been good but not nearly good enough, Mr. McCaffrey pointed out.

It is true, the International executive said, that forest survey figures now indicate that over-all drain and growth of all species in the South are in balance. "But let's not fool ourselves because considering pine alone, total use exceeded growth by about three million cords in 1950" and "it is reasonable to assume that the situation today is just about the same because while we have improved cutting, fire control, planting etc., the consumption too has increased and we are no more than holding our own."

What does southern industry propose to do about it? First of all, the 100 percent support of all southern mills must be drafted in stepping up the conservation program of the association, Mr. McCaffrey said. Secondly, any educational program of the type carried on by the industry calls for the periodic firing up of enthusiasm, beefing up old and workable ideas that are always good from the standpoint of a constantly-changing public, and the examination and introduction of new ideas.

"In a program such as this, which is purely educational, we sometimes lose our enthusiasm for the work we are doing," the speaker said. "Projects seem to get old, but we shouldn't lose sight of the fact that each year there are changes in ownership, shifts in population and children growing to adulthood, so that we continually have new and different people to whom we should tell our story and with whom we must work."

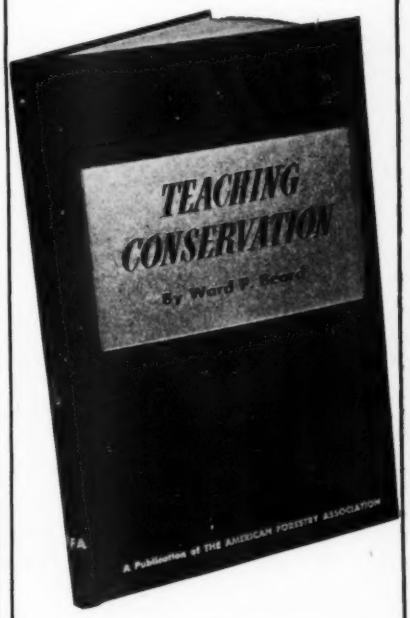
An anticipated increase in use of pulpwood of 107 percent by 1975 means just one thing. Mr. McCaffrey told his audience. It means that southern industry and the southern public should both pitch in and grow trees as they have never been grown before. For this type of increased production in a region that has already seen phenomenal advances in the last 15 years means more substantial dividends to everybody.

For example, in 1951 pulp and paper mills in the South employed 68,320 persons with total wages of $212,315,000. An additional 53,185 laborers were employed in the woods with no payroll figure available. Thus 121,505 people were gainfully employed by the industry. Over 1.8 billion dollars has been attracted to the South to finance the industry. The sales of the industry were over two billion dollars as compared with the value of 2.9 billion dollars for the cotton crop of years back. The industry also paid nearly 273 million dollars in taxes to the federal government in 1951.

But with the predicted doubling in size of the pulp and paper industry by 1975, practically all of these figures will be doubled, Mr. McCaffrey said. That means employment for 250,000 in plants and woods; a payroll of nearly 500 million dollars for plant employees and more than four billion dollars in sales. The amount paid owners, wood labor and transportation to mill is more than that of the mill wage earners, he added.

"The responsibility we have in this association then is really twofold," Mr. McCaffrey said. "One is in the field of human resources and the other is the natural resources. The wood must be grown in order to assure for the people of the South and nation this increasing economic stability arising from the conversion of trees into useful pulp and paper products."

TEACHING CONSERVATION



By WARD P. BEARD
Assistant Director, Vocational Education, U. S. Office of Education

Designed for

Conservation Workshops

Teacher Study Groups

Individual Teachers

Professional Foresters

Conservation Educators

Textbook Use

144 pages — Illustrated
Price $1.50

AFA Members Entitled to 10% Discount.

Published by

THE AMERICAN FORESTRY ASSOCIATION

919 Seventeenth Street N. W.
Washington 6, D. C.

Feature Photo of the Month

Photos used on this page will be of unusual rather than esthetic qualities and subject matter will be restricted to scenes, events, objects or persons related to the use, enjoyment or unique aspects of our renewable natural resources. For each picture selected AMERICAN FORESTS *will pay $10.*

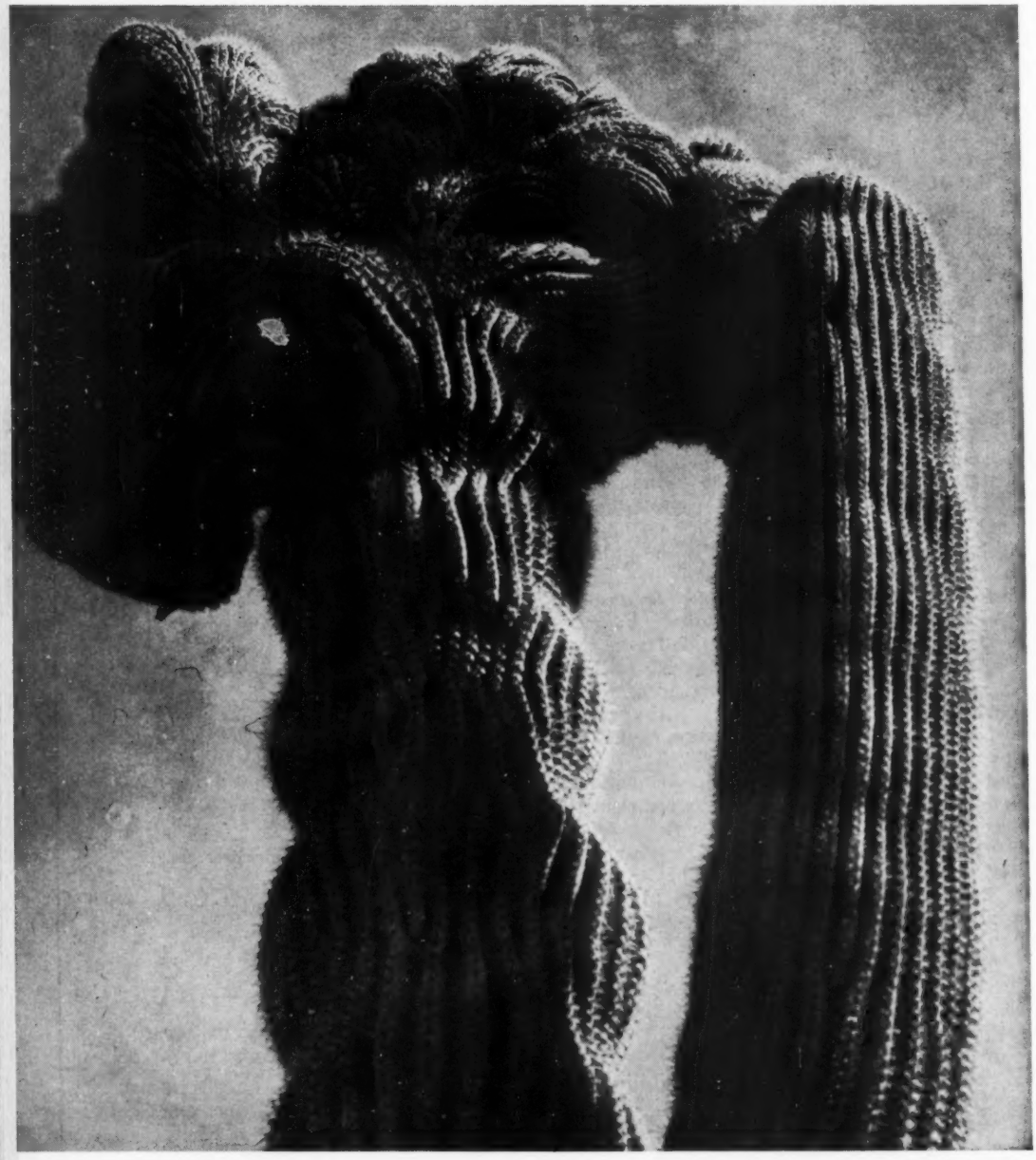


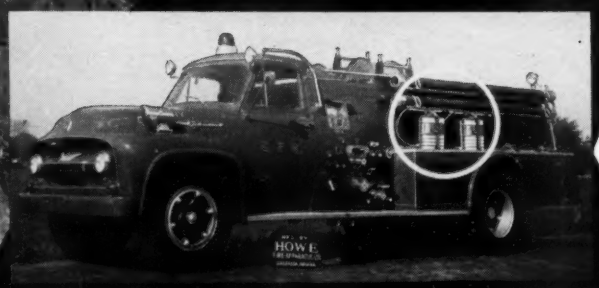
Photo submitted by Edna Hoffman Evans, Lakeland, Fla.

Crazy, mixed up cactus—closeup view of the fasciated portion and of the normal branch of a saguaro. The small dark protrusions on the left are remains of flowers from the previous summer's blooms

The INDIAN is available in the lever type, known as our No. 80 INDIAN.

"We have used **SMITH INDIAN FIRE PUMPS** for several years and now need two more which please ship at once. We cannot afford to be without **INDIANS** and consider them to be the handiest piece of fire fighting equipment on our truck."

F. H. SANDERS, Mayor
Aliceville, Alabama



Fire Truck unit built by Howe Fire Apparatus Co. of Anderson, Ind. and recently delivered to Library Fire Dept.; Library, Pa. Note **INDIAN FIRE PUMPS** mounted in place. More new trucks are coming through with **INDIANS** as specified equipment.

D. B. SMITH & CO.

405 MAIN ST.
UTICA 2, N. Y.

Hercules Equipment & Rubber Company, Inc. San Francisco 7, Calif.
Halprin Supply Co. Los Angeles 15, Calif.

PACIFIC COAST BRANCHES
Fred E. Barnett Co. Portland, Oregon
Fred E. Barnett Co. Klamath Falls, Oregon
Mill & Mine Supply, Inc. Seattle 4, Washington
L. M. Curtis & Sons Salt Lake City, Utah

CANADIAN AGENTS
Fleck Bros. Limited Vancouver, B.C., Canada
C. E. Hickey & Sons, Ltd. Hamilton, Canada

6000 hours before its first overhaul!

Clearing underbrush and building roads in a stand of sugar pine, yellow pine and red and white fir near Viola, California. Production here, with one D7 road building, one arching and two ground skidding, averaged 200,000 bd. ft. per 9-hour day.

D7 PURCHASED IN 1947 STILL GOING STRONG AFTER 11,000 HOURS OF HARD WORK

This CAT* D7 Tractor with No. 7A Bulldozer and Hyster winch is one of four D7s owned by Ned Putnam, Klamath Falls, Oregon. At the time this picture was taken last year near Viola, California, he said: "We work our Caterpillar equipment under some pretty tough conditions. This D7 had about 6000 hours on it before we overhauled it. And now, with 11,000 hours on it, it's still doing fine."

Stamina and the capacity for hard work are *built* into this husky unit. For example, the No. 7A Bulldozer blade, of heavily reinforced construction, is *matched* with the D7's horsepower, weight and traction for big production. Designed to *roll* the dirt in heaping loads, it also has maximum strength at points of stress to stand up under a beating. The operator, sitting down, has a clear view of the job, plus "finger-tip" steering for positive control of each track for maneuvering in tight spots.

When you invest in a D7, you get a tractor engineered to do *more* work at *lower* cost with *less* down time than any competitive machine. You get a unit built to stay on the job year after year. And you're backed by a reliable source of service and parts — your nearby Caterpillar Dealer. Ask him for the latest information about the D7 with its new oil-type clutch, which enables you to operate much longer between adjustments and replacement than with the conventional dry clutch. Name the date — he'll be glad to demonstrate!

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks — ®

USE CAT EQUIPMENT FOR LOW-COST PRODUCTION